5.2. Locality option 2: Site B.

Site B is located to the south of where the Spitskop-Segoditshane 132kV line crosses the D112 roadway and is directly south of Site A. This proposed development area is therefore also already marginally impacted by an existing powerline servitude. The actual site area is typical of the vegetation type, being an open bushveld savanna; however, it has been subjected to greater negative ecological impacts through historical land management practices, vegetation removal and poor veld management (than that of Site A and, to a lesser degree, Site C). Trees and shrubs were well represented throughout the site, with grasses dominating the understory. There was a higher degree of bare soil observed within this site. The actual powerline servitude was once again typically void of trees and tall shrubs and dominated by pioneering grass species and smaller shrubs. Figure 6 presents various views of Site option B.

Figure 6: Various views of Site locality option B.

This site showed a relatively lower density of nationally protected tree species as well as other larger and well-established trees than that of Site A and C. The two species that were observed,

namely *Combretum imberbe* (Leadwood) and *Sclerocarya birrea* subsp *caffra* (Marula) are protected under the National Forests Act 84 of 1998 and therefore application to the DWAF would have to be made in order to remove these trees prior to the commencement of any construct activities.

There is a lower density of these protected tree species within this proposed site in relation to the other two construction site options (Sites A and C) and a higher proportion of bare soil. Some areas were also dominated by *Dichrostachys cinerea* (Sickle bush) that is an indication of veld disturbances. It is therefore recommended that this site be the site of choice for the proposed Dwaalboom Switching Station due to these features being the main ecological deciding factors that were observed during the field surveys. The localities of the protected tree species are presented in Figure 5. The dominant species observed within this habitat unit are presented in Table 8.

Table 8: Dominant floral species observed throughout the site option B locality. Exotic species are indicated with *.

Grasses/Sedges/Reeds	Trees/Shrubs	Forbs
Aristida congesta *Aristida scabrivalvis* *Cynodon dactylon* *Digitaria eriantha* *Eragrostis curvula* *Eragrostis superba* *Heteropogon contortus* *Panicum maximum* *Pogonarthria squarrosa* *Schizachyrium sanguineum* *Setaria sphacelata* *Setaria verticillata* *Trachypogon spicatus* *Urochloa mossambica*	*Acacia ataxacantha* *Acacia karroo* *Acacia mellifera* *Acacia tortilis* *Aloe greatheadii* var. *davyana* *Aloe marlothii* *Asparagus laricinus* *Combretum hereroense* *Combretum imberbe* *Combretum zeyheri* *Dichrostachys cinerea* *Dombeya rotundifolia* *Elephantorrhiza elephantina* *Euclea undulata* *Grewia flava* *Grewia monticola* *Maytenus polyacantha* *Ozoroa paniculosa* *Peltophorum africanum* *Rhus lancea* *Rhus leptodictya* *Rhus pyroides* *Sclerocarya birrea* subsp *caffra* *Sida rhombifolia** *Ziziphus mucronata* *Ximenia caffra* *Solanum panduriforme** *Datura stramonium**	*Bidens pilosa** *Portulaca kermesina* *Schkuhria pinnata** *Tagetes minuta**

The vegetation community structure has been largely transformed at this site. This is readily observable in the grass community structures as well as the presence of large proportions of bare soils. The overall PES of the site was therefore considered to be *Low-Medium*. This feature

makes this site the preferred option from an ecological perspective for the construction of the proposed Dwaalboom Switching Station.

5.3. Locality option 3: Site C.

Site C is approximately 5km by road from Sites A and B and is located where the Spitskop-Segoditshane 132kV line crosses the road that leads to Nonceba. The proposed development area is therefore already marginally impacted by an existing powerline servitude. The actual site area is typical of the vegetation type, being an open bushveld savanna. Trees and shrubs were well represented throughout the site, with grasses dominating the understory. Figure 7 presents various views of Site option C.

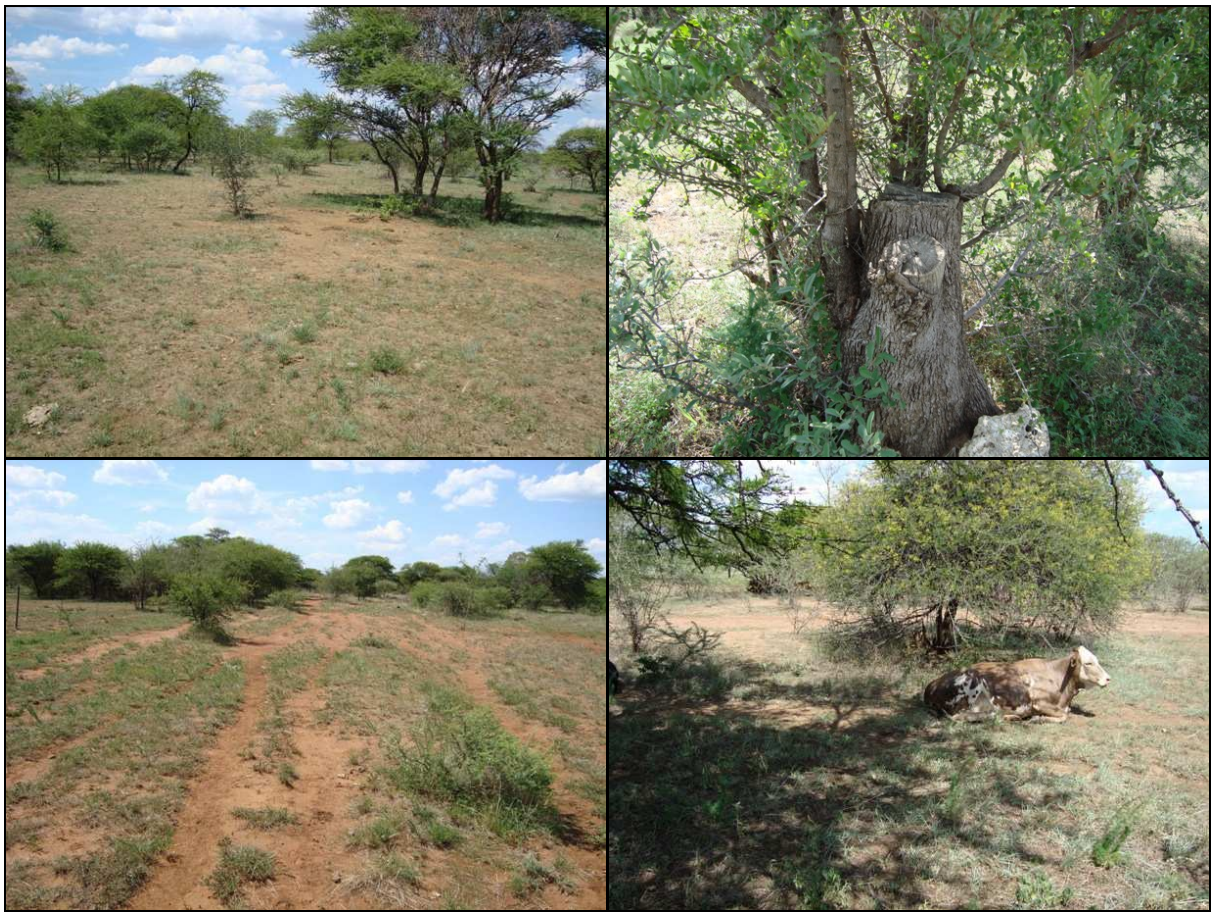

Figure 7: Various views of Site locality option C.

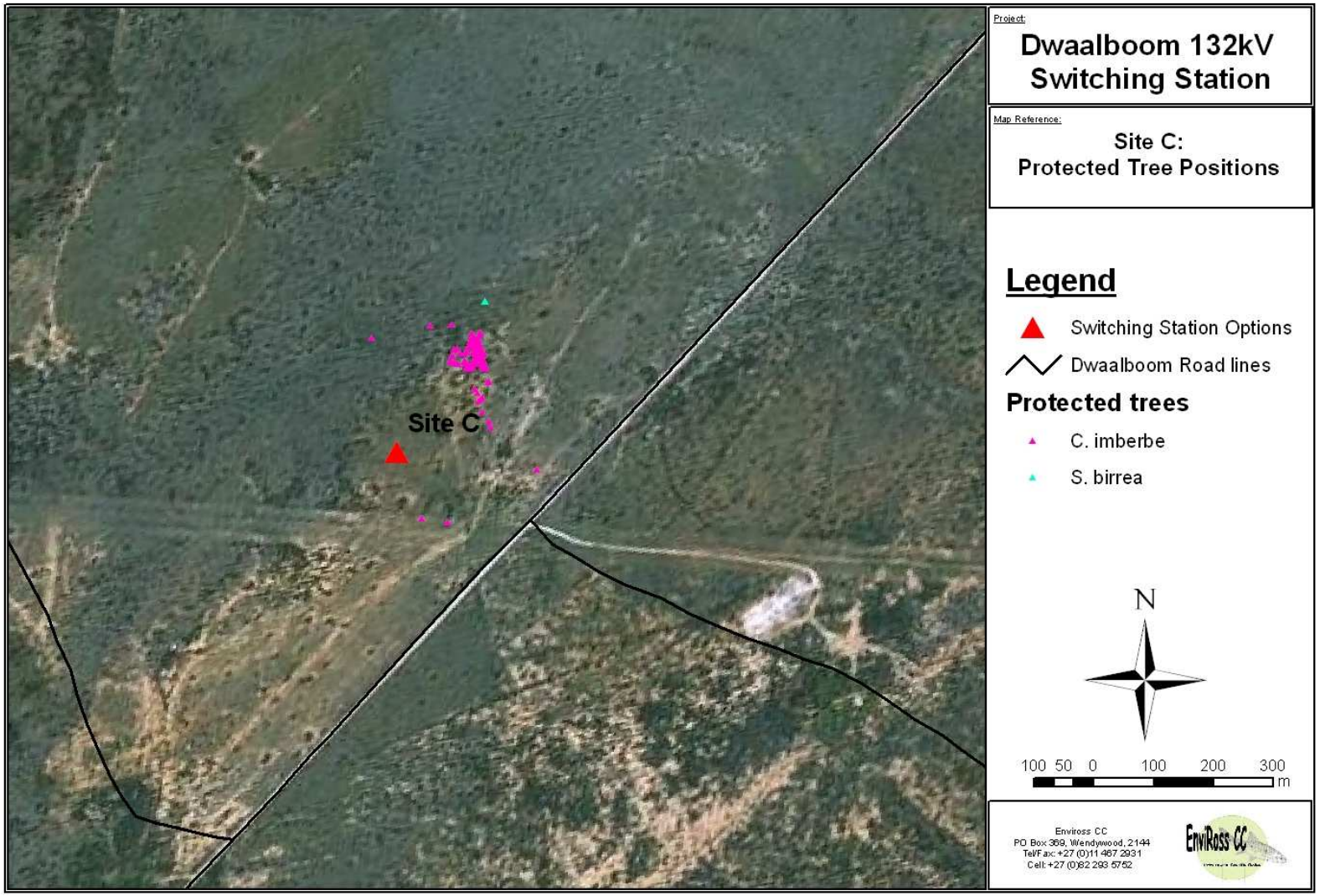

Figure 8: Dwaalboom Switching Station site locality option C showing the localities of the protected tree species.

This site showed a relatively high density of nationally protected tree species as well as other larger and well-established trees. Two species in particular, namely *Combretum imberbe* (Leadwood) and *Sclerocarya birrea* subsp *caffra* (Marula) are protected under the National Forests Act 84 of 1998 and therefore application to the DWAF would have to be made in order to remove these trees prior to the commencement of any construct activities.

There is a higher density of these protected tree species within this proposed site in relation to Site B, but less than Site A. This site is a viable option for the proposed Dwaalboom Switching Station from an ecological perspective due to the high degree of agricultural usage (livestock grazing) and associated vegetation transformations. It is, however, recommended that Site B be utilised for the switching station. This site (Site C) has retained a relatively high density of protected tree species. The localities within the local area of these protected tree species were marked with a GPS during the field survey. These localities are presented in Figure 8. The dominant species observed within this habitat unit are presented in Table 7.

Table 9: Dominant floral species observed throughout the site option C locality. Exotic species are indicated with *.

Grasses/Sedges/Reeds	Trees/Shrubs	Forbs
Aristida congesta *Aristida scabrivalvis* *Cynodon dactylon* *Eragrostis curvula* *Eragrostis superba* *Heteropogon contortus* *Panicum maximum* *Pogonarthria squarrosa* *Schizachyrium sanguineum* *Setaria sphacelata* *Setaria verticillata* *Trachypogon spicatus* *Urochloa mossambica*	*Acacia ataxacantha* *Acacia karroo* *Acacia mellifera* *Acacia tortilis* *Aloe greatheadii* var. *davyana* *Aloe marlothii* *Asparagus laricinus* *Combretum hereroense* *Combretum imberbe* *Combretum zeyheri* *Dichrostachys cinerea* *Dombeya rotundifolia* *Elephantorrhiza elephantina* *Euclea undulata* *Grewia flava* *Grewia monticola* *Maytenus polyacantha* *Ozoroa paniculosa* *Peltophorum africanum* *Rhus lancea* *Rhus leptodictya* *Rhus pyroides* *Sclerocarya birrea* subsp *caffra* *Sida rhombifolia** *Ziziphus mucronata* *Ximenia caffra* *Solanum panduriforme** *Datura stramonium**	*Portulaca kermesina* *Schkuhria pinnata** *Tagetes minuta** *Bidens bipinnata** *Gomphrena celosioides**

The vegetation community structure has been retained at this site; however, agricultural utilisation meant that the overall PES of the site was considered to be *Medium*. Some areas were also dominated by *Dichrostachys cinerea* (Sickle bush) that is an indication of veld disturbances. This site could potentially be utilised as the proposed Dwaalboom Switching Station with minimal negative ecological impacts on the overall conservation of biodiversity within the region.

6. Flora and Fauna Assessments.

6.1. Floral Assessments.

6.1.1. RDL Floral Status Assessments.

No Red Data Listed floral species were observed during the field surveys of all three locality options for the proposed Dwaalboom Switching Station.

6.1.2. Protected species.

The Department of Water Affairs and Forestry (DWAF), being the custodians of forested and wooded areas throughout South Africa, has, through the National Forests Act (Act 84 of 1998) issued a list of protected tree species. This list is populated by trees that are heavily exploited for their resource value, play an important role in the ecosystem, form important components in medicinal/spiritual traditions or have suffered historical over-exploitation. In terms of section 15 (1), an application to the DWAF needs to be made prior to damaging or removing any of the species that appear on this list.

Two listed species were observed within all three of the proposed development sites, namely *Combretum imberbe* (Leadwood) and *Sclerocarya birrea* subsp *caffra* (Marula). The density of these species varied from one site to the next (see Figure 5 and Figure 8). An application will need to be placed with the DWAF for the removal of these species prior to the construction of the proposed switching station. It is recommended that larger individuals of these trees be allowed to remain *in situ* as far as possible and the proposed development activities accommodate this by being designed and placed in such a way as to avoid disturbing these individuals where possible. Figure 9 shows representatives of these two species.

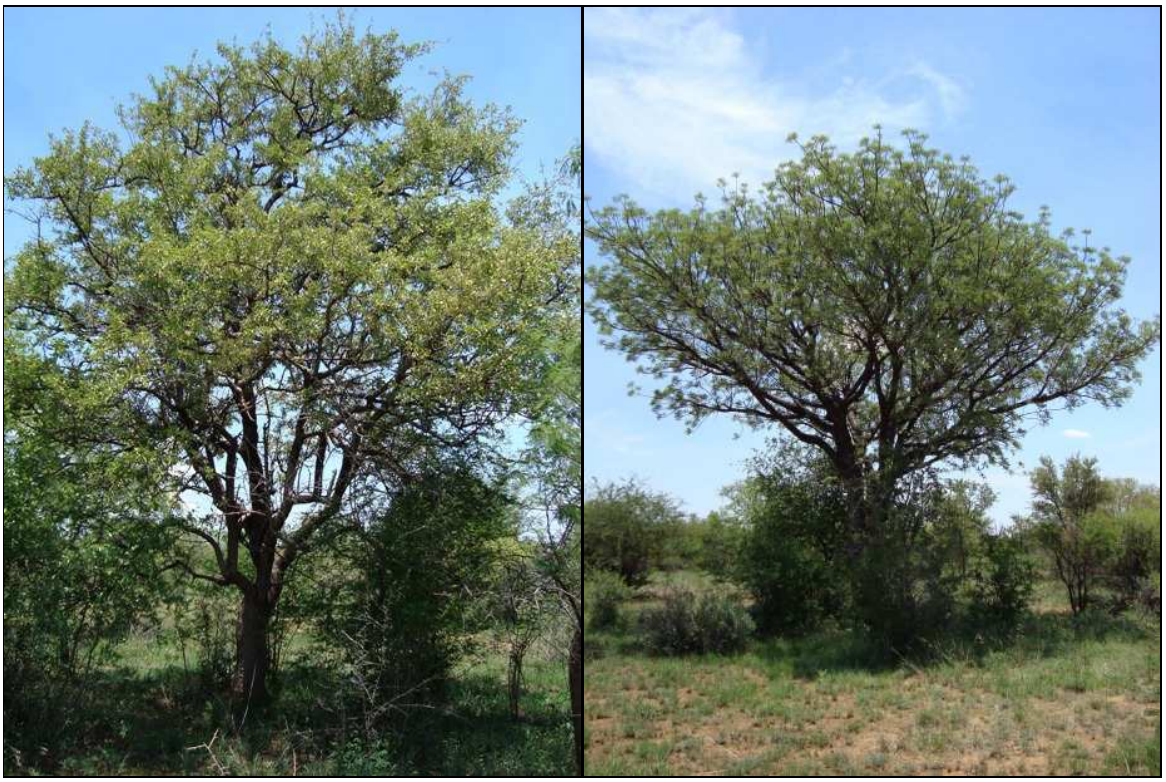

Figure 9: *Combretum imberbe* (Leadwood) (left) and *Sclerocarya birrea* subsp *caffra* (Marula) (right) that features strongly within the area.

6.1.3. Exotic and Invader Species.

Alien invaders are plants that are of exotic origin and are invading previously pristine areas or ecological niches (Bromilow, 2001). Not all weeds are exotic in origin, but, as these exotic plant species have very limited natural "check" mechanisms within the natural environment, they are often the most opportunistic and aggressively-growing species within the ecosystem. Therefore, they are often the most dominant and noticeable within an area. Disturbances of the ground through trampling, excavations or landscaping often leads to the dominance of exotic pioneer species that rapidly dominate the area. Under natural conditions, these pioneer species are overtaken by sub-climax and climax species through natural veld succession. This process, however, takes many years to occur, with the natural vegetation never reaching the balanced, pristine species composition prior to the disturbance. There are many species of indigenous pioneer plants, but very few indigenous species can out-compete their more aggressively-growing exotic counterparts.

Alien vegetation invasion causes degradation of the ecological integrity of an area, causing (Bromilow, 2001):

- A decline in species diversity;
- Local extinction of indigenous species;
- Ecological imbalance;
- Decreased productivity of grazing pastures;
- Abnormally high biomass that leads to increase devastation during veld or bush fires; and
- Increased agricultural input costs.

Grasslands are particularly prone to bush encroachment and alien vegetation invasion as this vegetation type is the most utilised for agricultural purposes. This is mainly for livestock grazing, or complete transformation for agronomy (crops). These areas therefore suffer the highest degree of degrading factors that include overgrazing, trampling, incorrect fire management, and removal as grassland areas are traditionally sought after for agronomy as they often occur on rich, fertile soils. These factors lead to an imbalance in the species composition and make the grasslands prone to alien vegetation invasion. Exotic trees and shrubs often invade grasslands, with the grass species not being able to compete with the deeper-rooted and taller trees for moisture and light and are therefore quickly displaced. A loss of floral and faunal species diversity then occurs that was once dependent on the grassland. Figure 10 presents the percentage land surface of North West Province that is invaded by exotic floral species. The proposed development area suffers 0.5 to 5% exotic floral species invasion (NWDACE SoER, 2002).

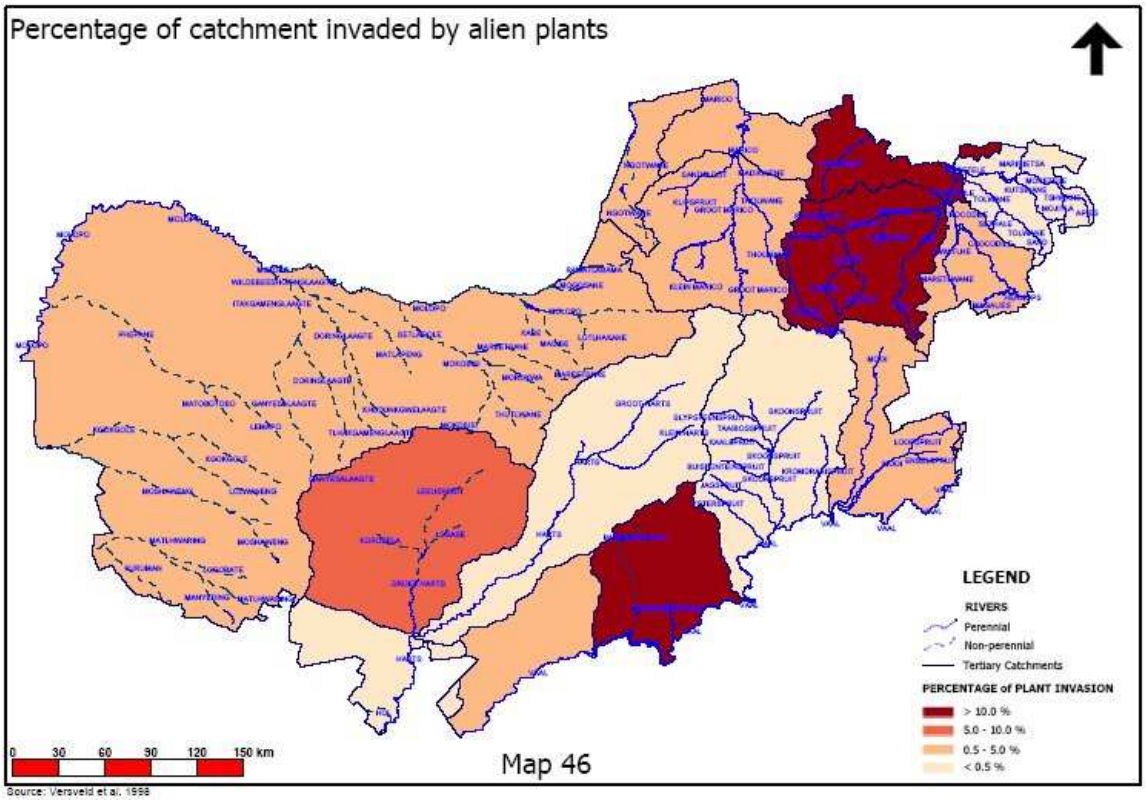

Figure 10: Percentage of invasion by exotic floral species for North West Province (NWDACE SoER, 2002).

Table 10 presents the most important alien invasive tree species recorded for North West Province.

Table 10: The most important dominant exotic woody species identified for North West Province (NWDACE SoER, 2002).

Species	English name	Origin	Declared status
Acacia baileyana	Bailey's wattle	Australia	
Acacia dealbata	silver wattle	Australia	yes(i)
Acacia decurrens	green wattle	Australia	
Acacia mearnsii	black wattle	Australia	yes(i)
Acacia podalyriifolia	pearl acacia	Australia	
Alhagi maurorum	camelthorn bush	Europe/Asia	yes(w)
Araujia sericifera	moth catcher	S America (Ven.)	
Arundo donax	Spanish reed	Europe (Med.)	
Atriplex nummularia	salt bush	Australia	
Cestrum laevigatum	inkberry	S America	yes(w)
Cotoneaster franchetii	cotoneaster	Asia	
Grevillea robusta	silky oak	Australia	
Jacaranda mimosifolia	jacaranda	S America	proposed(i)
Lantana camara	lantana	C & S America	yes(w)
Melia azedarach	syringa	Asia	proposed(i)
Morus alba	white mulberry	Asia	proposed(i)
Nerium oleander	oleander	Europe (Med.)	proposed(i)
Nicotiana glauca	wild tobacco	S America	proposed(w)
Passiflora caerulea	passion flower	S America	
Populus alba	white poplar	Europe/Asia	
Populus canescens	grey poplar	Europe/Asia	
Prosopsis glandulosa	mesquite	N & C America	yes(i)
Prosopsis velutina	mesquite	N & C America	yes(i)
Psidium guajava	guava	Trop. America	proposed(i)
Racantha angustifolia	yellow firethorn	Asia	proposed(i)
Ricinus communis	castor-oil plant	tropical Africa	
Robinia pseudoacacia	black locust	N America	
Rosa eglanteria	sweetbriar	Europe/Asia	proposed(i)
Rubus spp.	exotic brambles	N Amer./Eur.	yes(w); proposed(i)
Salix babylonica	weeping willow	Asia	
Schinus molle	pepper tree	S America	
Senna didymobotrya	peanut butter cassia	tropical Africa	
Sesbania punicea	red sesbania	S America	yes(w)
Solanum mauritianum	bugweed	S America	yes(w)
Solanum sisymbriifolium	bitter apple	Trop. America	yes(w)
Tecoma stans	yellow bells	Trop. America	proposed (i)

The plants declared as weeds or invaders and their control are subject to *The Conservation of Agricultural Resources Act (Act No. 43 of 1983).*

The proposed development area largely incorporated savanna areas that had seen a degree of vegetation transformation through historical powerline construction and ongoing agricultural (livestock grazing and trampling of the vegetation) activities. Invasion of exotic floral species was,

however, not observed to be widespread or an important feature of the any of the three locality options for the proposed construction activities. The remoteness of the area and surrounding savanna habitat presumably meant that there was limited seedbank availability for exotic floral species. The disturbance factors that the sites have been subjected to meant that many pioneering species were observed within the understory. This aspect was not perceived as being problematic. Certain areas showed a feature known as bush encroachment. Species such as *Dichrostachys cinerea* and *Acacia tortilis* are typical species demonstrating this feature. Following veld disturbances within bushveld areas, these species pioneer the area and quickly become dominant – often forming impenetrable stands, decreased opportunity for grass cover and decreases species diversity within the area.

Occurrences of exotic vegetation were found to be localised and not aggressively invasive. This would allow for relatively easy mechanical removal of the individual plants, without adversely affecting the surrounding habitats. For the exotic species noted for each site locality, refer to the species lists for the sites.

6.1.4. Medicinal Plant Species.

Plants with traditional medicinal value are not necessarily indigenous species, with many of them being regarded as alien invasive weeds. Table 11 presents a list of plant species with traditional medicinal value, plant parts traditionally used and their main applications, which were identified during the field assessment. These species are all regarded as common and widespread species.

Table 11: Traditional medicinal plants identified during the field assessment. Medicinal applications and application methods are also presented (van Wyk, et al., 1997).

Species	Name	Plant parts used	Medicinal uses
Datura stramonium	Thornapple	Leaves and rarely the green fruit.	Generally as asthma treatment and pain reduction.
Helichrysum spp.	Hottentot's tea	Leaves and twigs mainly used, sometimes roots.	General remedy – coughs, colds, fever, infections, headaches, menstrual pain and wound dressing.
Leonotis microphylla	Wild dagga	Leaves and stems, sometimes roots.	Dried parts smoked for relief of epilepsy. Leaves and roots widely used for a remedy for snake bite and other stings and bites. External decoctions used as a treatment for boils, eczema, skin diseases, itching and muscular cramps. Internal decoctions used for coughs, colds and influenza, bronchitis, high blood pressure and headaches. Leaf infusions have been used for asthma and viral hepatitis.
Vernonia oligocephala	Bitterbossie	Leaves and twigs, rarely the roots, are used.	Infusions taken for abdominal pain and colic. Other ailments treated include rheumatism, dysentery and diabetes. Roots have been used to treat ulcerative colitis.
Ziziphus mucronata	Buffalo thorn	Roots, bark or leaves used separately or in combination.	Warm bark infusions (sometimes together with roots or leaves added) are used as expectorants (also as emetics) in cough and chest problems, while root infusions are a popular remedy for diarrhoea and dysentery. Decoctions of roots and leaves (or chewed leaves) are applied externally to boils, sores and glandular swellings, to promote healing and as an analgesic.

The floral species of medicinal value that were identified during the field assessment are all regarded as being common and widespread species and therefore the proposed development activities pose an insignificant risk to the conservation of important plant species with medicinal value within the region.

6.2. Faunal Assessments.

The faunal assessment was undertaken largely as a desktop study as time limitations for field assessments restricted the ability to conduct adequate species counts. In addition, the often secretive and nocturnal nature of many species reduces the likelihood of encountering them during a diurnal field assessment. It was also regarded as being unnecessary to apply standard trapping methodologies to assess faunal diversity. Faunal assessments are therefore largely based on desktop review, habitat diversity, quality and availability.

6.2.1. Mammals.

There was a number of naturally-occurring mammal species indirectly observed during the field assessment and the area is known to be historically rich in mammal diversity, with 109 mammalian species of known historical distribution ranges that incorporate the proposed development site and surrounding areas. Direct observations were made of Steenbok (*Raphicerus campestris*), Black-backed Jackal (*Canis mesomelas*), Scrub hare (*Lepus saxatilis*) and Common molerat (*Cryptomus hottentotus*), whilst indirect observations of Porcupine (*Hystrix africaeaustralis*) and various other small mammal (mostly rodent) species were noted during the field survey. No direct or indirect signs of any RDL mammalian species were observed at any of the proposed development sites.

The potential mammal list (based on the known historical distributions) is given in Appendix B, Table 18. Even though larger mammals are included in this list, it must be remembered that these records are of *known historical records*. It therefore includes species that would not be encountered due to larger mammals being confined mostly to fenced-off nature reserves. Examples of these species would be rhinoceros and elephant that are found in the nearby Madikwe Game Reserve. This lack of mobility or migratory freedom means that they would not realistically be found within the area. Smaller mammals (small carnivores and rodents, etc.) and highly-mobile mammals (e.g. bats) are more likely to inhabit the site.

A survey of the habitat types and quality indicated that there are only potentially two out of the 28 RDL mammalian species recorded from the region that would potentially be dependent on the habitat that incorporates the proposed development area. See *Section 7. Red Data Species Index*

Score (RDSIS) for further detail. The species of conservational interest to North West Province, as noted by NWDACE (2002) are presented in Appendix C, Table 25.

6.2.2. Avifauna.

The area surrounding the proposed development site is known to be relatively rich in avifaunal diversity, with a recorded list of 390 species (QDS 2426DD). This species list is presented in Appendix B, Table 19, with the species observed during the field survey being indicated as bold text. This is of the known historical distribution list for all of the species listed.

As birds are highly mobile, they can move away from unfavourable areas and habitats. They are therefore not directly affected by small, localised developments unless they are directly dependent on the habitat that will be subject to the development. It must, however, be noted that habitat destruction is the leading cause of species decline, and the cumulative effects of localised habitat destruction needs to be taken into consideration. The species of conservational interest to North West Province, as noted by NWDACE (2002) are presented in Appendix C, Table 25. There are no RDL avifaunal species that are regarded to significantly rely on the habitat type and quality that is presented by the proposed development site and therefore the proposed development activities are regarded to have an insignificant impact on the overall conservation of RDL avifaunal species recorded from the region. Nearby formally conserved areas such as Madikwe and Pilanesberg Game Reserves also protect habitat of more suitable quality and also therefore offer better habitat for any RDL avifaunal species recorded from the region. Also see *section 7. Red Data Species Index Score (RDSIS)* for further detail.

6.2.3. Reptiles.

There are 66 reptile species that have a distribution range that correlates to the proposed development area, with two of these species being regarded as being RDL. No RDL species were found to have a significant dependence on the habitat quality and quantity that are offered by the proposed development site. Commonly-occurring reptile species, namely *Mabuya striata punctatissima* (Striped Skink), *Mabuya varia* (Variable Skink) and *Lagodactylus capensis* (Cape Dwarf Gecko) were observed on the site during the field assessment. This is by no means an indication of the potential reptile diversity list for the area as no nocturnal and trapping surveys were undertaken. The localised extent of the proposed development activities and the availability of vast areas of similar habitat within the surrounding region means that the proposed development activities are perceived to pose an insignificant threat to RDL reptile conservation within the region. This potential species list is based on known historical distribution records and is presented in Appendix B, Table 21.

6.2.4. Amphibians.

There were no amphibian species noted during the field assessment probably due to the lack of permanent water associated with the proposed development areas. Nocturnal surveys and trapping were also not undertaken. These observations can therefore not be taken as being a true representation of the amphibian species list for the sites. There are 21 amphibian species known from the area, one of which is the *Near threatened* Giant bullfrog (*Pyxicephalus adspersus*). This species has very specific habitat requirements for breeding, foraging and over-wintering that are not met by the habitat offered by the proposed development sites. The potential species list from known historical records is presented in Appendix B, Table 22.

6.2.5. Invertebrates.

A desktop review of available literature allowed for the identification of potential and previously-recorded RDL invertebrates and potential habitat to support various RDL invertebrate species to be reviewed that were relevant to the proposed development site. Special emphasis was placed on searching and habitat potential identification for the RDL invertebrate species listed by the available literature.

Methodical searching along set transects and within set quadrants, where rock turning, sweeping-netting and burrow excavations were techniques employed to determine if the proposed development site supported any RDL invertebrate species.

There were no RDL invertebrates directly observed during the field survey. Open-ended burrows were observed, serving as indirect sightings of scorpions. Even though species could not be verified, it is assumed that these were the burrows of *Opistophthalmus* sp. This is a commonly-occurring genus within the area.

Observations of butterfly species were limited to commonly-occurring and widely distributed species. Two butterfly species are listed by NWDACE (SoER, 2002) as being of conservational concern, namely *Metisella meninx* and *Acraea machequena.* Both the known distribution and habitat availability do not correspond with the proposed development area and therefore these species are irrelevant to the proposed development activities. These are the only two invertebrate species listed as being RDL for North West Province (NWDACE SoER, 2002). There are scorpion and Mygalomorph spiders that are recorded for the area and therefore are relevant to the proposed development activities. The species are presented in Appendix B, Table 23 and Table 24, respectively. These two taxa are generally protected nationally due to collection pressure for the pet trade and habitat destruction. Limited data collection, however, means that they are probably more widely distributed than previously thought. The most dominant invertebrate species

observed and collected are presented in Table 12. The species of conservational interest to North West Province, as noted by NWDACE (2002) are presented in Appendix C, Table 25.

It should be noted that the species diversity that was observed is by no means an indication of the complete invertebrate diversity potential of the proposed development site and surrounding area.

Table 12: General results from invertebrate collecting.

Taxon	Comments
Insects	
Order: Lepidoptera (Butterflies & Moths) Family: Lycaenidae Subfamily: Lycaeninae *Eicochrysops messapus* (Cupreous blue) Family: Pieridae Subfamily: Pierinae *Belonis aurota aurota* (Brown-veined white) Family: Acraeidae *Acraea horta* (Garden acraea) Various diurnal moths were also observed throughout the site.	Visual observations: These are all commonly-occurring species typical of the locality and habitat.
Order: Orthoptera (Grasshoppers, Crickets & Locusts) Family: Gryllidae *Acanthogryllus fortipes* (Brown cricket)	Visual observations and sweep-netting. A wide diversity of species observed.
Order: Coleoptera (Beetles) Family: Carabidae *Thermophilum homoplatum* (Two-spotted ground beetle) *Anthia thoracica* (Ground beetle) Family: Melyridae *Astylus atromaculatus* (Spotted maize beetle)	Visual observations: Those presented are the dominant species. These are all commonly-occurring species.
Order: Hymenoptera (Ants & wasps) Family: Formicidae (Ants) Family: Vespidae (Paper wasps)	Visual observations showed this order to be common within the area.
Order: Diptera (Flies)	Visual observations showed this taxon to be commonly-represented throughout the study area.
Order: Blattodea (Cockroaches)	Visual observations showed this order to be common within the area.
Order: Hemiptera (Bugs)	Visual observations showed this taxon to be commonly-represented throughout the study area.
Spiders	
Order: Araneae Family: Lycosidae Family: Gnaphosidae Family: Pholcidae Family: Eresidae Family: Selenopidae Family: Salticidae	Commonly-occurring spiders were visually observed.

Taxon	Comments
Centipedes & Millipedes	
Superclass: Myriapoda	Commonly-occurring taxa that were collected and observed through pitfall traps and visual observations.

The localised extent of the proposed development areas that are surrounded by vast areas of similar habitat means that the proposed development activities are perceived to have insignificant negative impacts on the overall conservation of RDL invertebrate species within the region.

7. Red Data Sensitivity Index Scoring (RDSIS).

After application of the RDSIS (the methodology of which is described in Section 3.3) it was found that the proposed development site (and the surrounding area) was *historically* relatively rich in species diversity. The historical powerline construction and ongoing agricultural activities meant that habitat disturbances at all three proposed sites had decreased the habitat quality and therefore potential to support sensitive and RDL species. Subsistence hunting and gathering within the area by people from surrounding communities and farm labour also added to the lowered potential of the area for supporting RDL or sensitive species. Habitat fragmentation due to impassable game fencing has lead to the loss of habitat and inevitable decline of all of many historically-recorded species. Many of these species (especially larger mammals) are now only found confined to fenced reserves, where the habitat is also conserved. This means that many of the smaller species also remain within these reserves due to the preservation of suitable habitat.

The results of the RDSIS are outlined below, where the species with known *historical* distributions are used to populate the list. The numbers of species of relevance to the proposed development area and their conservational status are summarised in Table 13 and Table 14 according to their POC values, with the complete results of the RDSIS presented in Table 15.

Table 13: Summary of RDL species status for the proposed development area.

Taxon	Total species	Total RDL	RDL category*						POC# ≥60%
			CE	EN	VU	NT	RA	DD	
Mammals	109	28	0	2	6	9	0	11	2
Birds	390	15	0	0	4	0	5	6	2
Reptiles	66	2	0	0	1	0	1	0	0
Amphibians	21	1	0	0	0	1	0	0	0
Totals:		**46**	**0**	**2**	**12**	**11**	**6**	**17**	**4**

*CE-Critically endangered; EN-Endangered; VU-Vulnerable; NT-Near threatened RA-Rare & DD-Data deficient.
#POC – Probability of Occurrence.

It can be seen from Table 13 that the property potentially offers viable habitat (POC ≥ 60%) for 2 out of the 28 (7.1%) potential RDL mammal species listed for the area. The habitat is also considered to be relevant to 2 of the 15 (13.3%) RDL avifaunal species. This is largely due to the openness of the surrounding area and the relatively close proximity of large conserved areas such as Madikwe and Pilanesberg Nature Reserves. The POC ≥60% categories are dominated by *Vulnerable* (2 birds) and *Data Deficient* (2 mammalian) species.

Table 14: RDL fauna species POC category summary for the proposed development area.

Taxon	Total species	Total RDL	POC Category*				
			L	LM	M	MH	H
Mammals	109	28	10	5	12	1	0
Birds	390	15	9	3	1	2	0
Reptiles	66	2	0	2	0	0	0
Amphibians	21	1	1	0	0	0	0
Totals:		**46**	**20**	**10**	**13**	**3**	**0**

*L-Low (0-20%); LM-Low medium (21-40%); M-Medium (41-60%); MH-Medium high (61-80%) & H-High (81-100%).

Table 14 indicates that the majority of the RDL species listed for the area fall into the POC category of *low* to *medium* (0-60%), with no species categorised as having a *high* (>80%) POC. All of the species with POC ≥60% values are presented in Table 16.

Table 15: The results of the RDSIS for the proposed development area. Species of relevance (POC ≥ 60%) are highlighted in bold text.

Species	Common name	RDL status	RDL factor	Total	POC	Distr	Hab	Food
MAMMALS								
Lycaon pictus	African Wild Dog	EN	1.7	31.2	18.3	30.0	0.0	25.0
Damaliscus lunatus lunatus	Tsessebe	EN	1.7	17.0	10.0	20.0	0.0	10.0
Diceros bicornis minor	Black Rhinoceros	VU	1.5	15.0	10.0	10.0	0.0	20.0
Acinonyx jubatus	Cheetah	VU	1.5	22.5	15.0	35.0	5.0	5.0
Panthera leo	Lion	VU	1.5	20.0	13.3	30.0	5.0	5.0
Manis temminckii	Pangolin	VU	1.5	30.0	20.0	30.0	25.0	5.0
Hippotragus equinus	Roan Antelope	VU	1.5	7.5	5.0	10.0	0.0	5.0
Hippotragus niger niger	Sable Antelope	VU	1.5	12.5	8.3	20.0	0.0	5.0
Hyaena brunnea	Brown Hyaena	NT	0.7	35.0	50.0	65.0	35.0	50.0
Rhinolophus darlingi	Darling's Horseshoe Bat	NT	0.7	32.7	46.7	50.0	35.0	55.0
Rhinolophus clivosus	Geoffroy's Horseshoe Bat	NT	0.7	24.5	35.0	15.0	35.0	55.0
Rhinolophus hildebrandtii	Hildebrandt's Horseshoe Bat	NT	0.7	33.8	48.3	55.0	35.0	55.0
Mellivora capensis	Honey Badger	NT	0.7	33.8	48.3	65.0	35.0	45.0
Pipistrellus rusticus	Rusty Bat	NT	0.7	30.3	43.3	45.0	30.0	55.0
Miniopterus schreibersii	Schreibers' Long-fingered Bat	NT	0.7	32.7	46.7	50.0	35.0	55.0
Leptailurus serval	Serval	NT	0.7	28.0	40.0	65.0	20.0	35.0
Atelerix frontalis	South African	NT	0.7	31.5	45.0	65.0	25.0	45.0

Species	Common name	RDL status	RDL factor	Total	POC	Distr	Hab	Food
	Hedgehog							
Poecilogale albinucha	African Weasel	DD	0.2	11.7	58.3	65.0	60.0	50.0
Tatera leucogaster	**Bushveld Gerbil**	**DD**	**0.2**	**14.0**	**70.0**	**80.0**	**75.0**	**55.0**
Myosorex varius	Forest Shrew	DD	0.2	1.0	5.0	10.0	0.0	5.0
Suncus lixus	Greater Dwarf Shrew	DD	0.2	8.0	40.0	10.0	55.0	55.0
Crocidura hirta	Lesser Red Musk Shrew	DD	0.2	11.7	58.3	65.0	55.0	55.0
Crocidura cyanea	Reddish-grey Musk Shrew	DD	0.2	8.0	40.0	10.0	55.0	55.0
Elephantulus brachyrhynchus	**Short-snouted Elephant-shrew**	**DD**	**0.2**	**12.0**	**60.0**	**90.0**	**35.0**	**55.0**
Lemniscomys rosalia	Single-striped Mouse	DD	0.2	9.3	46.7	60.0	35.0	45.0
Hipposideros caffer	Sundevall's Leaf-nosed Bat	DD	0.2	8.0	40.0	45.0	25.0	50.0
Crocidura mariquensis	Swamp Musk Shrew	DD	0.2	1.3	6.7	15.0	0.0	5.0
Crocidura fuscomurina	Tiny Musk Shrew	DD	0.2	8.3	41.7	15.0	55.0	55.0
		BIRDS						
Ardeotis kori	Kori Bustard	VU	1.5	25.0	16.7	5.0	25.0	20.0
Gyps coprotheres	**Cape Vulture**	**VU**	**1.5**	**105.0**	**70.0**	**85.0**	**65.0**	**60.0**
Polemaetus bellicosus	**Martial Eagle**	**VU**	**1.5**	**97.5**	**65.0**	**75.0**	**65.0**	**55.0**
Torgos tracheliotus	Lappetfaced Vulture	VU	1.5	75.0	50.0	65.0	35.0	50.0
Charadrius pallidus	Chestnutbanded Plover	Rare	0.5	1.2	2.3	2.0	0.0	5.0
Falco peregrinus	Peregrine Falcon	Rare	0.5	15.8	31.7	25.0	25.0	45.0
Ixobrychus minutus	Little Bittern	Rare	0.5	1.7	3.3	5.0	0.0	5.0
Leptoptilos crumeniferus	Marabou Stork	Rare	0.5	15.0	30.0	20.0	15.0	55.0
Mycteria ibis	Yellowbilled Stork	Rare	0.5	4.2	8.3	25.0	0.0	0.0
Ciconia nigra	Black Stork	DD	0.2	4.6	23.0	65.0	2.0	2.0
Gorsachius leuconotus	Whitebacked Night Heron	DD	0.2	0.5	2.3	2.0	0.0	5.0
Ixobrychus sturmii	Dwarf Bittern	DD	0.2	0.5	2.3	2.0	0.0	5.0
Phoenicopterus minor	Lesser Flamingo	DD	0.2	0.7	3.3	5.0	5.0	0.0
Porzana pusilla	Baillon's Crake	DD	0.2	0.5	2.3	2.0	0.0	5.0
Pterocles gutturalis	Yellowthroated Sandgrouse	DD	0.2	2.3	11.7	15.0	5.0	15.0
		REPTILES						
Python natalensis	Southern African Python	VU	1.5	45.0	30.0	45.0	20.0	25.0
Dalophia pistillum	Blunt-tailed Worm Lizard	Rare	0.5	15.8	31.7	35.0	35.0	25.0
		AMPHIBIANS						
Pyxicephalus adspersus	Giant Bullfrog	NT	0.7	11.0	15.7	20.0	2.0	25.0

SP SCORE – TOTAL (all RDL species)	952.5
SP SCORE – AVERAGE (all RDL species)	20.7
THREATENED TAXA - AVERAGE (RDL const ≥1.5)	38.7
AVERAGE	29.7
% SPP ≥60%	8.7
RDSIS OF SITE (%)	**19.2**

Table 15 presents the completed RDSIS for the variety of faunal taxa that have known distribution ranges that include the property and surrounding areas. The species with a POC value of ≥ 60%

(*medium-high* to *high* probability of occurrence) are highlighted in bold text. Many of these species are perceived to utilise the proposed development site for foraging potential rather than being directly dependent on it for roosting or breeding purposes as they are highly mobile species.

The proposed development site therefore does offer viable habitat that potentially supports some RDL species from various taxa. It must be taken note of that the greatest threat to species of conservational significance is the destruction and fragmentation of habitat and that the cumulative effect of "localised" developments plays an important role in this process.

The proposed development site scored a relevance rating of potentially supporting any RDL faunal species of 19.2%. This is regarded as a *low* value. This translates to the fact that the proposed development activities, with adherence to an appropriately-managed Environmental Management Plan (EMP), are perceived to have an insignificant negative impact on the overall conservation of biodiversity within the region.

Table 16: RDL fauna species summary for species with a POC value of ≥60%.

Common name	Species	RDL status	POC
MAMMALS			
Tatera leucogaster	Bushveld Gerbil	DD	70.0
Elephantulus brachyrhynchus	Short-snouted Elephant-shrew	DD	60.0
BIRDS			
Gyps coprotheres	Cape Vulture	VU	70.0
Polemaetus bellicosus	Martial Eagle	VU	65.0

8. Migratory corridors.

Maintaining migratory connectivity through migratory corridors and open spaces is important to the ongoing conservation of species to allow for species to exploit suitable habitat types for foraging and breeding purposes as well as to escape unfavourable conditions. It is also to maintain genetic diversity of species as habitat fragmentation often leads to the ecological and genetic isolation of populations of the same species. This eventually leads to a lack of genetic diversity that inevitably weakens the species, making the species as a whole succumb more readily when adverse conditions are encountered.

The proposed development sites fall within an area that has been subjected to relatively little historical development and therefore the surrounding landscape remains open. Farm boundaries are largely in the form of 6-strand cattle/sheep fencing, which do not pose a threat to natural species migrations at present. Very few ecological features exist within the immediate vicinity as

well that could affect migratory potential of mobile species. Larger wild animals that were historically recorded for the area are presently confined to fenced-off reserves within the region and therefore the proposed development activities are irrelevant to them. The proposed development is fairly localised in extent and therefore is perceived to have an insignificant impact on habitat fragmentation within the area.

9. Sensitivity mapping.

None of the proposed development localities incorporate ecologically sensitive habitat units. The sites do, however, incorporate tree species that are included in the protected tree list from the National Forests Act 84 of 1998. The localities of these individuals are presented in Figure 5 (Sites A and B) and Figure 8 (Site C). Site B incorporates the least amount of protected trees and also has suffered the highest degree of habitat transformation of the three sites. It is therefore recommended that this site be considered as the most ecologically viable site to develop.

10. Conclusions & Recommendations.

Field surveys were undertaken during December 2008 to ascertain the ecological state of the three locality options for the proposed Eskom Holdings Dwaalboom Switching Station development. It was found that the proposed development area has suffered general veld transformation and retrogression and that no particularly ecologically sensitive habitat areas were observed. The sites were found to incorporate protected tree species that will need to be considered during the planning and construction phase of the proposed development activities. Specific conclusions and recommendations are listed below:

- Some tree species were observed that will be affected by the proposed development activities (*Combretum imberbe* and *Sclerocarya birrea* subsp *caffra*). These species are protected within South Africa under the National Forests Act (Act 84 of 1998) and therefore permits to remove them need to be made to the relevant authority (DWAF) prior to commencement of the proposed development activities;
- No RDL faunal or floral species were noted at any of the proposed localities during the field assessment;
- A desktop review and further field observations showed the proposed development sites to have limited relevance to RDL species conservation within the region;

- Site B was found to have suffered the greatest degree of veld retrogression and also incorporated the lowest density of protected tree species. It is therefore recommended that this site be considered as the most viable locality option from an ecological standpoint;
- An EMP has been proposed and it is recommended that the points outlined therein be adhered to (Appendix D). This will ensure that the proposed development activities will inflict the least amount of negative ecological impact as possible.

11. References.

Acocks, J.P.H. (1988) **Veld types of South Africa.** Memoirs of the botanical survey of South Africa No. 57. Botanical Research Institute, South Africa.

Branch, B. (1998) **Field guide to snakes and other reptiles of southern Africa.** Struik Publishers, Cape Town.

Bredenkamp, G. and van Rooyen, N. (1998) **Mixed Bushveld (18).** *In:* Low, A.B. and Rebelo, A.G. (Eds) **Vegetation of South Africa, Lesotho and Swaziland.** Department of Environmental Affairs & Tourism (DEAT), Pretoria, South Africa.

Bromilow, C. (2001) **Problem plants of South Africa.** Briza Publications, Pretoria.

Carruthers, V. (2001) **Frogs and frogging in southern Africa.** Struik Publishers, Cape Town.

Coates-Palgrave, K. (2000) **Trees of southern Africa – second edition.** Struik Publishers, Cape Town.

Coetzee, K. (2005) **Caring for natural rangelands.** University of Kwazulu-Natal Press, South Africa.

Davis, B. and Day, J. (1998) **Vanishing waters.** University of Cape Town Press, Cape Town, South Africa.

Dippenaar-Schoeman, A.S. and Jocqué, R. (1997) **African spiders – An identification manual.** Plant Protection Research Institute Handbook No. 9. Biosystematics Division, ARC – Plant Protection Research Institute, Pretoria.

Dippenaar-Schoeman, A.S. (2002) **Baboon and trapdoor spiders of southern Africa.** ARC Handbook, No. 13. Agricultural Research Council, Pretoria.

Du P. Bothma, J. (Editor) (2002) **Game ranch management - 4th ed.** Van Schaik Publishers, Pretoria.

EWT (2008) **The Environmental Impact Assessment Toolkit.** Law and Policy Working Group (L&PWG), Endangered Wildlife Trust, Johannesburg, South Africa. Website accessed 3 Dec 2008. http://www.eiatoolkit.ewt.org.za/

Friedmann, Y. and Daly, B, (editors) (2004) **Red Data Book of the mammals of South Africa: a conservation assessment: CBSG southern Africa, Conservation Breeding Specialist Group (SSC/IUCN).** Endangered Wildlife Trust, South Africa.

Gibbon, G., John Voelcker Bird Book Fund (2002) **Roberts' multimedia birds of southern Africa – version 3**. Southern African Birding CC, Westville, South Africa.

Grant, R. and Thomas, V. (1998). **SAPPI tree spotting – Kwazulu-Natal, coast and midlands. Tree identification made easy.** Jacana Education (Pty) Ltd., Johannesburg.

Harrison J. A., Burger M., Minter L. R., De Villiers A.L., Baard E. H. W., Scott E., Bishop & Ellis S. (2001). **Conservation assessment and management plan for southern African frogs. Final Report.** IUCN/SSC Conservation Breeding Specialist Group: Apple Valley, MN.

Henderson, L. (2001) **Alien weeds and invasive plants – A complete guide to declared weeds and invaders in South Africa.** Plant Protection Research Institute, Agricultural Research Council Handbook No 12. Pretoria.

Kemper, N.P (2001) **RVI Riparian vegetation index.** WRC Report No 850/3/01, Water research Commission, Pretoria.

Henning, S. F. and Henning, G. A. (1989) **South African red data book – butterflies.** South African National Scientific Programmes Report No. 158, Foundation for Research Development, Pretoria.

Langer, R. H. M. and Hill, G. D. (1991) **Agricultural plants – second edition.** Cambridge University Press, Cambridge.

Marais, J. (2004) **A complete guide to the snakes of southern Africa.** Struik Publishers, Cape Town.

Mucina, L. and Rutherford, M.C. (Eds) (2006) **The vegetation of South Africa, Lesotho and Swaziland. *Strelitzia 19.*** South African National Biodiversity Institute, Pretoria.

NWPDACE (2002) **North West Province State of Environment Report 2002.** North West Province Department of Conservation and Environment, Private Bag X2039, Mmabatho, 2735.

Newman, K. (1998) **SAPPI Newman's birds of southern Africa.** Southern Book Publishers, Halfway House (Midrand).

Pooley, E. (1998) **A field guide to wild flowers Kwazulu-Natal and the eastern region.** Natal Flora Publications Trust.

SANBI (2008) The South African National Biodiversity Institute is thanked for the use of data from the National Herbarium, Pretoria (PRE) Computerised Information System (PRECIS).

SANBI (2008) Plants of southern Africa: A checklist. Website accessed 3 Dec 2008. http://posa.sanbi.org/searchspp.php

Schmidt, E., Lötter, M. and McClelland, W. (2002) **Trees and shrubs of Mpumalanga and Kruger National Park.** Jacana Publishers, Johannesburg, South Africa.

Skinner, J. D. and Smithers, R. H. N. (1990) **The mammals of the southern African sub region.** University of Pretoria, Pretoria.

Stuart, C. and Stuart, T. (1993) **Field guide to the mammals of southern Africa.** Struik Publishers, Cape Town.

Stuart, C. and Stuart, T. (1994) **A field guide to the tracks and signs of southern and east African wildlife.** Southern Book Publishers, Halfway House, South Africa.

Tainton, N. (Editor) (1999) **Veld management in South Africa.** University of Natal Press, Pietermaritzburg.

Tarboton, W. and Tarboton, M. (2002) **A fieldguide to the dragonflies of South Africa.** Warwick & Michèle Tarboton, Modimolle, South Africa.

Tarboton, W. and Tarboton, M. (2005) **A fieldguide to the damselflies of South Africa.** Warwick & Michèle Tarboton, Modimolle, South Africa.

Threatened Species Programme (2005) **Red Data List of South African Plant Species.** Available online: http://www.redlist.org.

Van Oudtshoorn, F. (1999) **Guide to grasses of southern Africa.** Briza Publications, Pretoria.

Van Wyk, B. and Malan, S. (1998) **Field guide to the wild flowers of the Highveld.** Struik Publishers, Cape Town.

Van Wyk, B. and Smith , G. (1996) **Guide to the Aloes of South Africa.** Briza Publications, Pretoria.

Van Wyk, B., van Oudtshoorn, B. and Gericke, N. (1997) **Medicinal plants of South Africa.** Briza Publications, Pretoria.

Van Wyk, B. van Wyk, P. and van Wyk, B. (2000) **Photographic guide to trees of southern Africa.** Briza Publications, Pretoria.

Woodhall, S. (2005) **Field guide to butterflies of South Africa.** Struik Publishers, Cape Town.

Appendix A – Protected tree species of South Africa (National Forest Act (Act 84 of 1998).

Table 17: List of protected tree species of South Africa as per National Forests Act (Act 84 of 1998). The species observed during the field assessment are highlighted in grey.

Botanical Name	English Common Names	Other Common Names "Afrikaans (A), Northern Sotho (NS), Southern Sotho (S), Tswana (T), Venda (V), Xhosa (X), Zulu (Z)"	SA Tree No
Acacia erioloba	Camel Thorn	"Kameeldoring (A), Mogohlo (NS), Mog“tlh“ (T)"	168
Acacia haematoxylon	Grey Camel Thorn	"Vaalkameeldoring (A), Mokholo (T)"	169
Adansonia digitata	Baobab	"Kremetart (A), Seboi (NS), Mowana (T)"	467
Afzelia quanzensis	Pod Mahogany	"Peulmahonie (A), Mutokota (V), Inkehli (Z)"	207
Balanites subsp maughamii	Torchwood	"Groendoring (A), Ugobandlovu (Z)"	251
Barringtonia racemosa	Powder-puff Tree	"Poeierkwasboom (A), Iboqo (Z)"	524
Boscia albitrunca	Shepherd’s Tree	"Witgat (A), Mohl“pi (NS), Motlh“pi (T)," "Muvhombwe (V), Umgqomogqomo (X)," Umvithi (Z)	122
Brachystegia spiciformis	Msasa	Msasa (A)	198.1
Breonadia salicina	Matumi	"Mingerhout (A), Mohlomˆ (NS), Mutu-lume (V), Umfomfo (Z)"	684
Bruguiera gymnorrhiza	Black Mangrove	"Swart-wortelboom (A), Isikhangati (X)," Isihlobane (Z)	527
Cassipourea swaziensis	Swazi Onionwood	Swazi-uiehout (A)	531.1
Catha edulis	Bushman’s Tea	"Boesmanstee (A), Mohlatse (NS), Igqwaka"(X), Umhlwazi (Z)"	404"
Ceriops tagal	Indian Mangrove	"Indiese wortelboom (A), Isinkaha (Z)"	525
Cleistanthus schlechteri var. schlechteri	False Tamboti	"Vals-tambotie (A), Umzithi (Z)"	320
Colubrina nicholsonii	Pondo Weeping Thorn	Pondo-treurdoring (A)	453.8
Combretum imberbe	Leadwood	"Hardekool (A), Mohwelere-t?hipi (NS), Motswiri (T), Impondondlovu (Z)"	539
Curtisia dentata	Assegai	"Assegaai (A), Umgxina (X), Umagunda (Z)"	570
Elaeodendron transvaalensis	Bushveld Saffron	"Bosveld-saffraan (A), Monomane (T)," Ingwavuma (Z)	416
Erythrophysa transvaalensis	Bushveld Red Balloon	"Bosveld-rooiklapperbos (A), Mofalatsane (T)"	436.2
Euclea pseudebenus	Ebony Guarri	Ebbehout -ghwarrie (A)	598
Ficus trichopoda	Swamp Fig	"Moerasvy (A), Umvubu (Z)"	54
Leucadendron argenteum	Silver Tree	Silwerboom (A)	77
Lumnitzera racemosa var. racemosa	Tonga Mangrove	"Tonga-wortelboom (A), Isikhaha-esibomvu (Z)"	552
Lydenburgia abottii	Pondo Bushman’s Tea	Pondo-boesmanstee (A)	407
Lydenburgia cassinoides	Sekhukhuni Bushman’s Tea	Sekhukhuni-boesmanstee (A)	406
Mimusops caffra	Coastal Red Milkwood	"Kusrooimelkhout (A), Umthunzi (X)," Umkhakhayi (Z)	583
Newtonia hildebrandtii var. hildebrandtii	Lebombo Wattle	"Lebombo-wattel (A), Umfomothi (Z)"	191
Ocotea bullata	Stinkwood	"Stinkhout(A), Umhlungulu (X), Umnukane (Z)"	118
Ozoroa namaquensis	Gariep Resin Tree	Gariep-harpuisboom (A)	373.2
Philenoptera violacea	Apple-leaf	"Appelblaar (A), Mphata (NS), Mohata (T), Isihomohomo (Z)	238
Pittosporum viridiflorum	Cheesewood	"Kasuur (A), Kgalagangwe (NS), Umkhwenkwe (X), Umfusamvu (Z)"	139
Podocarpus elongatus	Breede River Yellowwood	Breederivier-geelhout (A)	15
Podocarpus falcatus	Outeniqua Yellowwood	"Outniekwa-geelhout (A), Mog“bag“ba (NS)," Umkhoba (X)/ Umsonti (Z)	16
Podocarpus henkelii	Henkel’s Yellowwood	"Henkel-se-geelhout (A), Umsonti (X), Umsonti (Z)"	17

Botanical Name	English Common Names	Other Common Names "Afrikaans (A), Northern Sotho (NS), Southern Sotho (S), Tswana (T), Venda (V), Xhosa (X), Zulu (Z)"	SA Tree No
Podocarpus latifolius	Real Yellowwood	"Opregte-geelhout (A), Mog"bag"ba (NS), Umcheya (X), Umkhoba (Z)"	18
Protea comptonii	Saddleback Sugarbush	Barberton-suikerbos (A)	88
Protea curvata	Serpentine Sugarbush	Serpentynsuikerbos (A)	88.1
Prunus africana	Red Stinkwood	"Rooi-stinkhout(A), Umkhakhase (X)," Umdumezulu (Z)	147
Pterocarpus angolensis	Wild Teak	"Kiaat (A), Mor"t" (NS), Mokwa (T), Mutondo (V), Umvangazi (Z)"	236
Rhizophora mucronata	Red Mangrove	"Rooi-wortelboom (A), Isikhangathi (X)," Umhlume (Z)	526
Sclerocarya birrea subsp. *caffra*	Marula	"Maroela (A), Morula (NS), Morula (T), Umganu (Z)"	360
Securidaca longependunculata	Violet Tree	"Krinkhout (A), Mmaba (T)"	303
Sideroxylon inerme subsp. inerme	White Milkwood	"Wit-melkhout (A), Ximafana (X)," Umakhwelafingqane (Z)	579
Tephrosia pondoensis	Pondo Fish-poison Pea	Pondo-gifertjie (A)	226.1
Warburgia salutaris	Pepper-bark Tree	"Peperbasboom (A), Molaka (NS), Mulanga (V), Isibaha (Z)"	488
Widdringtonia cedarbergensis	Clanwilliam Cedar	Clanwilliam-seder (A)	19
Widdringtonia schwarzii	Willowmore Cedar	Baviaanskloof-seder (A)	21

Appendix B – Potential faunal biodiversity list from the region that incorporates the proposed development area

Table 18: Historically recorded mammalian species list for the region that incorporates the proposed development area.

Species	Name	Status
Aepyceros melampus	Impala	
Alcelaphus buselaphus	Red Hartebeest	
Antidorcas marsupialis	Springbok	
Ceratotherium simum	White Rhinoceros	
Connochaetes gnou	Black Wildebeest	
Connochaetes taurinus taurinus	Blue Wildebeest	
Damaliscus lunatus lunatus	Tsessebe	EN
Damaliscus pygargus phillipsi	Blesbok	
Diceros bicornis minor	Black Rhinoceros	VU
Equus burchellii	Plains Zebra	
Giraffa camelopardalis	Giraffe	
Hippopotamus amphibius	Hippopotamus	
Hippotragus equinus	Roan Antelope	VU
Hippotragus niger niger	Sable Antelope	VU
Kobus ellipsiprymnus ellipsiprymnus	Waterbuck	
Loxodonta africana	African Elephant	
Oreotragus oreotragus	Klipspringer	
Oryx gazella	Gemsbok	
Pelea capreolus	Grey Rhebok	
Phacochoerus africanus	Warthog	
Potamochoerus porcus koiropotamus	Bushpig	
Raphicerus campestris	Steenbok	
Redunca arundinum	Reedbuck	
Redunca fulvorufula	Mountain Reedbuck	
Sylvicapra grimmia	Common Duiker	
Syncerus caffer	Cape Buffalo	
Taurotragus oryx	Eland	
Tragelaphus angasii	Nyala	
Tragelaphus scriptus	Bushbuck	
Tragelaphus strepsiceros	Kudu	
Procavia capensis	Rock Hyrax	
Acinonyx jubatus	Cheetah	VU
Aonyx capensis	Cape Clawless Otter	
Atilax paludinosus	Water Mongoose	
Canis mesomelas	Black-backed Jackal	
Caracal caracal	Caracal	
Civettictis civetta	African Civet	
Cynictis penicillata	Yellow Mongoose	
Felis nigripes	Black-footed Cat	
Felis silvestris	African Wild Cat	
Galerella sanguinea	Slender Mongoose	
Genetta genetta	Small-spotted Genet	
Genetta tigrina	Large-spotted Genet	

Species	Name	Status
Helogale parvula	Dwarf Mongoose	
Hyaena brunnea	Brown Hyaena	NT
Ichneumia albicauda	White-tailed Mongoose	
Ictonyx striatus	Striped Polecat	
Leptailurus serval	Serval	NT
Lycaon pictus	African Wild Dog	EN
Mellivora capensis	Honey Badger	NT
Mungos mungo	Banded Mongoose	
Otocyon megalotis	Bat-eared Fox	
Panthera leo	Lion	VU
Panthera pardus	Leopard	
Poecilogale albinucha	African Weasel	DD
Proteles cristatus	Aardwolf	
Suricata suricatta	Suricate	
Vulpes chama	Cape Fox	
Hipposideros caffer	Sundevall's Leaf-nosed Bat	DD
Miniopterus schreibersii	Schreibers' Long-fingered Bat	NT
Neoromicia capensis	Cape Serotine Bat	
Nycteris thebaica	Egyptian Slit-faced Bat	
Pipistrellus rusticus	Rusty Bat	NT
Rhinolophus clivosus	Geoffroy's Horseshoe Bat	NT
Rhinolophus darlingi	Darling's Horseshoe Bat	NT
Rhinolophus hildebrandtii	Hildebrandt's Horseshoe Bat	NT
Rhinolophus simulator	Bushveld Horseshoe Bat	
Sauromys petrophilus	Flat-headed Free-tail Bat	
Scotophilus dinganii	Yellow House Bat	
Tadarida aegyptiaca	Egyptian Free-tailed Bat	
Taphozous mauritianus	Mauritian Tomb Bat	
Atelerix frontalis	South African Hedgehog	NT
Crocidura cyanea	Reddish-grey Musk Shrew	DD
Crocidura fuscomurina	Tiny Musk Shrew	DD
Crocidura hirta	Lesser Red Musk Shrew	DD
Crocidura mariquensis	Swamp Musk Shrew	DD
Myosorex varius	Forest Shrew	DD
Suncus lixus	Greater Dwarf Shrew	DD
Lepus saxatilis	Scrub / Savannah Hare	
Pronolagus randensis	Jameson's Red Rock Rabbit	
Cercopithecus aethiops pygerythrus	Vervet Monkey	
Galago moholi	Southern Lesser Galago	
Papio ursinus	Chacma Baboon	
Acomys spinosissimus	Spiny Mouse	
Aethomys ineptus	Tete Veld Rat	
Aethomys namaquensis	Namaqua Rock Mouse	
Cryptomys hottentotus	Common Mole-rat	
Dendromus melanotis	Grey Climbing Mouse	
Dendromus mystacalis	Chestnut Climbing Mouse	
Graphiurus murinus	Woodland Dormouse	
Hystrix africaeaustralis	Porcupine	
Lemniscomys rosalia	Single-striped Mouse	DD
Mastomys coucha	Multimammate Mouse	
Otomys angoniensis	Angoni Vlei Rat	

Species	Name	Status
Otomys irroratus	Vlei Rat	
Paraxerus cepapi	Tree Squirrel	
Pedetes capensis	Springhare	
Rhabdomys pumilio	Striped Mouse	
Saccostomus campestris	Pouched Mouse	
Steatomys pratensis	Fat Mouse	
Tatera brantsii	Highveld Gerbil	
Tatera leucogaster	Bushveld Gerbil	DD
Thallomys paedulcus	Tree Rat	
Thryonomys swinderianus	Greater Cane Rat	
Xerus inauris	Cape Ground Squirrel	
Elephantulus brachyrhynchus	Short-snouted Elephant-shrew	DD
Elephantulus myurus	Rock Elephant-shrew	
Manis temminckii	Pangolin	VU
Orycteropus afer	Aardvark	

Table 19: Bird list of the proposed development site and surrounding region (*QDS 2426DD*). Abbreviation explanations are given in Table 20.

Rob	English Name	Species	General Status	Habitats
1	Ostrich	*Struthio camelus*	R-C	BW, Ki, Gr, Ko, Ds, Fy, Fa
6	Great Crested Grebe	*Podiceps cristatus*	R(n)-U	Wa, Ms
7	Blacknecked Grebe	*Podiceps nigricollis*	R(n)-U	Wa, Ms
8	Dabchick	*Tachybaptus ruficollis*	R-C	Wa
49	White Pelican	*Pelecanus onocrotalus*	R-LC/R	Wa, Ms
50	Pinkbacked Pelican	*Pelecanus rufescens*	R-LC/R	Wa, Ms
55	Whitebreasted Cormorant	*Phalacrocorax lucidus*	R-C	Wa, Ms
58	Reed Cormorant	*Phalacrocorax africanus*	R-C	Wa
60	Darter	*Anhinga rufa*	R-C	Wa
62	Grey Heron	*Ardea cinerea*	R-C	Wa
63	Blackheaded Heron	*Ardea melanocephala*	R-C	Gr, Fa, Wa
64	Goliath Heron	*Ardea goliath*	R-U	Wa
65	Purple Heron	*Ardea purpurea*	R-U	Wa
66	Great White Egret	*Egretta alba*	R-C	Wa
67	**Little Egret**	***Egretta garzetta***	**R-C**	**Wa**
68	Yellowbilled Egret	*Egretta intermedia*	R-U	Wa
69	Black Egret	*Egretta ardesiaca*	R-LC/R	Wa
71	**Cattle Egret**	***Bubulcus ibis***	**R-C**	**BW, Gr, Fa, Wa**
72	Squacco Heron	*Ardeola ralloides*	R/NBM-U	Wa
74	Greenbacked Heron	*Butorides striatus*	R-U	Wa
76	Blackcrowned Night Heron	*Nycticorax nycticorax*	R-C	Wa
77	Whitebacked Night Heron	*Gorsachius leuconotus*	R-R	Wa
78	Little Bittern	*Ixobrychus minutus*	R/NBM-U	Wa
79	Dwarf Bittern	*Ixobrychus sturmii*	BM-R	Wa
81	Hamerkop	*Scopus umbretta*	R-C	Wa
83	White Stork	*Ciconia ciconia*	NBM-C	BW, Ki, Gr, Ko, Mo, Fa
84	Black Stork	*Ciconia nigra*	R-U/R	RC, Fa, Wa
85	Abdim's Stork	*Ciconia abdimii*	NBM-C	Ki, Gr, Ko, Fa, Wa
89	Marabou Stork	*Leptoptilos crumeniferus*	R-R/LC	BW, Wa
90	Yellowbilled Stork	*Mycteria ibis*	NBM/R-LC	Wa
91	Sacred Ibis	*Threskiornis aethiopicus*	R-C	Gr, Fa, Wa

Rob	English Name	Species	General Status	Habitats
93	Glossy Ibis	*Plegadis falcinellus*	R-U	Wa
94	**Hadeda Ibis**	***Bostrychia hagedash***	**R-A**	**Fo, BW, Gr, To, Fa, Wa**
95	African Spoonbill	*Platalea alba*	R(n)-C	Wa
96	Greater Flamingo	*Phoenicopterus ruber*	R(n)-LA	Wa, Ms
97	Lesser Flamingo	*Phoenicopterus minor*	R(n)-LA	Wa, Ms
99	Whitefaced Duck	*Dendrocygna viduata*	R-C	Wa
100	Fulvous Duck	*Dendrocygna bicolor*	R-C	Wa
101	Whitebacked Duck	*Thalassornis leuconotus*	R-U	Wa
102	Egyptian Goose	*Alopochen aegyptiacus*	R-A	Fa, Wa
103	South African Shelduck	*Tadorna cana*	E-C	Wa
104	Yellowbilled Duck	*Anas undulata*	R-A	Wa
105	African Black Duck	*Anas sparsa*	R-U	RC, Wa
106	Cape Teal	*Anas capensis*	R-C	Wa
107	Hottentot Teal	*Anas hottentota*	R-C	Wa
108	Redbilled Teal	*Anas erythrorhyncha*	R-C	Wa
112	Cape Shoveller	*Anas smithii*	Er-C	Wa
113	Southern Pochard	*Netta erythrophthalma*	R-C	Wa
115	Knobbilled Duck	*Sarkidiornis melanotos*	R-LC	Wa
116	Spurwinged Goose	*Plectropterus gambensis*	R-VC	Fa, Wa
117	Maccoa Duck	*Oxyura maccoa*	R-U	Wa
118	Secretarybird	*Sagittarius serpentarius*	R-U	BW, Ki, Gr, Ko, Ds, Fy, Mo, Fa
122	Cape Vulture	*Gyps coprotheres*	E-LC	BW, Ki, Gr, Ko, Ds, Fy, Mo, Fa
123	Whitebacked Vulture	*Gyps africanus*	R-C	BW, Ki, Ko, Ds
124	Lappetfaced Vulture	*Torgos tracheliotus*	R-U	BW, Ki, Ko, Ds
126	Black Kite	*Milvus migrans*	NBM-LC	BW, Ko, Ds, Fa
126.1	**Yellowbilled Kite**	***Milvus aegyptius***	**BM-C**	**Fo, BW, Gr, To, Fa**
127	**Blackshouldered Kite**	***Elanus caeruleus***	**R(n)-C**	**BW, Gr, Ko, Ds, Fa**
130	Honey Buzzard	*Pernis apivorus*	NBM-U	Fo, BW
131	Black Eagle	*Aquila verreauxii*	R-U	Mo, RC
132	Tawny Eagle	*Aquila rapax*	R-LC	BW, Ki
133	Steppe Eagle	*Aquila nipalensis*	NBM-U	BW, Ki
134	Lesser Spotted Eagle	*Aquila pomarina*	NBM-U	BW
135	Wahlberg's Eagle	*Aquila wahlbergi*	BM-C	BW, Ki, Fa
136	Booted Eagle	*Hieraaetus pennatus*	R/NBM-C	BW, Ki, Gr, Ko, Fy, Mo, Fa
137	African Hawk Eagle	*Hieraaetus spilogaster*	R-U	Fo, BW
138	Ayres' Eagle	*Hieraaetus ayresii*	R-R	Fo, BW
140	Martial Eagle	*Polemaetus bellicosus*	R-U	BW, Ki, Gr, Ko, Ds
142	Brown Snake Eagle	*Circaetus cinereus*	R-U	BW
143	Blackbreasted Snake Eagle	*Circaetus pectoralis*	R-U	BW, Ki, Ko, Ds, Fa
148	African Fish Eagle	*Haliaeetus vocifer*	R-C	Wa, Ms
149	Steppe Buzzard	*Buteo vulpinus*	NBM-C	BW, Gr, Ko, Fa
152	Jackal Buzzard	*Buteo rufofuscus*	E-C	Gr, Ko, Ds, Mo, RC, Fa
154	Lizard Buzzard	*Kaupifalco monogrammicus*	R-C	BW
156	Ovambo Sparrowhawk	*Accipiter ovampensis*	R-U	BW
157	Little Sparrowhawk	*Accipiter minullus*	R-C	Fo, BW
158	Black Sparrowhawk	*Accipiter melanoleucus*	R-C	Fo, RC
159	Little Banded Goshawk	*Accipiter badius*	R-C	BW
161	Gabar Goshawk	*Melierax gabar*	R-C	BW, Ki, To, Fa
162	Pale Chanting Goshawk	*Melierax canorus*	Er-C	BW, Ki, Ko, Ds
164	Eurasian Marsh Harrier	*Circus aeruginosus*	NBM-R	Gr, Wa
165	African Marsh Harrier	*Circus ranivorus*	R-C	Gr, Fa, Wa

Rob	English Name	Species	General Status	Habitats
166	Montagu's Harrier	*Circus pygargus*	NBM-R	Ki, Gr
167	Pallid Harrier	*Circus macrourus*	NBM-R	Ki, Gr, Fa
169	Gymnogene	*Polyboroides typus*	R-C	Fo, BW, Ko, RC
170	Osprey	*Pandion haliaetus*	NBM-U	Wa, Ms
171	Peregrine Falcon	*Falco peregrinus*	R/NBM-R	Fo, Gr, Ko, Ds, Mo, RC, To
172	Lanner Falcon	*Falco biarmicus*	R-C	BW, Ki, Ko, Ds, Fy, Mo, RC, To, Fa
173	Northern Hobby Falcon	*Falco subbuteo*	NBM-U	BW, Ki, Gr, Ko, Fa
179	Western Redfooted Kestrel	*Falco vespertinus*	NBM-R	BW, Ki, Gr, Fa
180	Eastern Redfooted Kestrel	*Falco amurensis*	NBM-C	BW, Gr, To, Fa
181	Rock Kestrel	*Falco rupicolis*	R-C	Ki, Gr, Ko, Ds, Fy, Mo, RC, Fa
182	Greater Kestrel	*Falco rupicoloides*	R-C	BW, Ki, Gr, Ko, Ds, Fa
183	Lesser Kestrel	*Falco naumanni*	NBM-VC	Gr, Ko, To, Fa
188	**Coqui Francolin**	***Peliperdix coqui***	**R-C**	**BW**
189	**Crested Francolin**	***Dendroperdix sephaena***	**R-VC**	**BW**
196	**Natal Francolin**	***Pternistis natalensis***	**Er-C**	**Fo, BW, RC**
199	**Swainson's Francolin**	***Pternistis swainsonii***	**Er-C**	**BW, Gr, Fa**
200	Common Quail	*Coturnix coturnix*	R/BM/NBM-C	Ki, Gr, Ko, Mo, Fa
201	Harlequin Quail	*Coturnix delegorguei*	R/BM-C	Gr, Fa
203	**Helmeted Guineafowl**	***Numida meleagris***	**R-VC**	**BW, Ki, Gr, Ko, Fa**
205	Kurrichane Buttonquail	*Turnix sylvatica*	R(n)-U/LC	BW, Gr, Fa
212	African Crake	*Crecopsis egregia*	BM-U	Gr, Wa
213	Black Crake	*Amaurornis flavirostris*	R-C	Wa
214	Spotted Crake	*Porzana porzana*	R-U	Gr, Wa
215	Baillon's Crake	*Porzana pusilla*	R-C	Wa
217	Redchested Flufftail	*Sarothrura rufa*	R-C	Wa
223	Purple Gallinule	*Porphyrio madagascariensis*	R-C	Wa
226	Common Moorhen	*Gallinula chloropus*	R-C	Wa
228	Redknobbed Coot	*Fulica cristata*	R-A	Wa
230	Kori Bustard	*Ardeotis kori*	R-R	BW, Ki, Gr, Ko, Ds
237	**Redcrested Korhaan**	***Eupodotis ruficrista***	**Es-C**	**BW, Ki**
239.1	Whitewinged Korhaan	*Eupodotis afraoides*	E-VC	Ki, Ko, Ds
240	African Jacana	*Actophilornis africanus*	R-VC	Wa
242	Old World Painted Snipe	*Rostratula benghalensis*	R-U	Wa
245	Ringed Plover	*Charadrius hiaticula*	NBM-C	Wa, Ms
247	Chestnutbanded Plover	*Charadrius pallidus*	R-U	Wa, Ms
248	Kittlitz's Plover	*Charadrius pecuarius*	R-C	Gr, Wa, Ms
249	Threebanded Plover	*Charadrius tricollaris*	R-C	Wa, Ms
252	Caspian Plover	*Charadrius asiaticus*	NBM-U	BW, Ki, Gr
254	Grey Plover	*Pluvialis squatarola*	NBM-C	Wa, Ms
255	**Crowned Plover**	***Vanellus coronatus***	**R-C**	**BW, Ki, Gr, Ko, Fy, To, Fa**
258	**Blacksmith Plover**	***Vanellus armatus***	**R-VC**	**Gr, Wa**
260	Wattled Plover	*Vanellus senegallus*	R/BM-LC	Gr, Wa
262	Ruddy Turnstone	*Arenaria interpres*	NBM-C	Ms
264	Common Sandpiper	*Actitis hypoleucos*	NBM-C	Gr, Wa, Ms
265	Green Sandpiper	*Tringa ochropus*	NBM-R	Wa
266	Wood Sandpiper	*Tringa glareola*	NBM-C	Wa
269	Marsh Sandpiper	*Tringa stagnatilis*	NBM-C	Wa, Ms
270	Greenshank	*Tringa nebularia*	NBM-C	Wa, Ms
272	Curlew Sandpiper	*Calidris ferruginea*	NBM-VC	Wa, Ms
274	Little Stint	*Calidris minuta*	NBM-C	Wa, Ms
281	Sanderling	*Calidris alba*	NBM-C	Wa, Ms

Rob	English Name	Species	General Status	Habitats
284	Ruff	*Philomachus pugnax*	NBM-C	Gr, Wa
286	Ethiopian Snipe	*Gallinago nigripennis*	R-LC	Gr, Wa
290	Whimbrel	*Numenius phaeopus*	NBM-C	Wa, Ms
294	Pied Avocet	*Recurvirostra avosetta*	R-LC	Wa, Ms
295	Blackwinged Stilt	*Himantopus himantopus*	R-C	Wa, Ms
297	**Spotted Dikkop**	***Burhinus capensis***	**R-C**	**BW, Ki, Gr, Ko, Ds, Fy, To, Fa, Ms**
298	Water Dikkop	*Burhinus vermiculatus*	R-C	Wa, Ms
300	Temminck's Courser	*Cursorius temminckii*	R-U	BW, Ki, Gr, Fa
303	Bronzewinged Courser	*Rhinoptilus chalcopterus*	R/BM-U	BW, Ki
305	Blackwinged Pratincole	*Glareola nordmanni*	NBM-LA	Gr
315	Greyheaded Gull	*Larus cirrocephalus*	R-VC	Wa, Ms
338	Whiskered Tern	*Chlidonias hybridus*	R(n)-LC	Wa
339	Whitewinged Tern	*Chlidonias leucopterus*	NBM-A	Wa
345	Burchell's Sandgrouse	*Pterocles burchelli*	E-C	Ki
346	Yellowthroated Sandgrouse	*Pterocles gutturalis*	R-LC	Gr, Fa
347	Doublebanded Sandgrouse	*Pterocles bicinctus*	Er-C	BW, Ki, Ko, Ds
348	Feral Pigeon	*Columba livia*	R-A	To, Fa
349	Rock Pigeon	*Columba guinea*	R-C	Mo, RC, To, Fa
350	Rameron Pigeon	*Columba arquatrix*	R-LC	Fo
352	Redeyed Dove	*Streptopelia semitorquata*	R-C	Fo, BW, To, Fa
354	**Cape Turtle Dove**	***Streptopelia capicola***	**R-VC**	**BW, Ki, Gr, Ko, Ds, Fy, To, Fa**
355	**Laughing Dove**	***Streptopelia senegalensis***	**R-VC**	**BW, Ki, Gr, Ko, Ds, Fy, To, Fa**
356	**Namaqua Dove**	***Oena capensis***	**R-VC**	**BW, Ki, Gr, Ko, Ds, To, Fa**
358	Greenspotted Dove	*Turtur chalcospilos*	R-C	BW, To
361	African Green Pigeon	*Treron calva*	R-C	Fo, BW
364	Meyer's Parrot	*Poicephalus meyeri*	R-C	BW
373	Grey Lourie	*Corythaixoides concolor*	R-C	BW, To
374	Eurasian Cuckoo	*Cuculus canorus*	NBM-U	BW, Mo
375	African Cuckoo	*Cuculus gularis*	BM-U	BW, Ki
377	**Redchested Cuckoo**	***Cuculus solitarius***	**BM-C**	**Fo, BW, To, Fa**
378	Black Cuckoo	*Cuculus clamosus*	BM-C	Fo, BW, To, Fa
380	Great Spotted Cuckoo	*Clamator glandarius*	NBM-U	BW
381	**Striped Cuckoo**	***Clamator levaillantii***	**BM-U**	**Fo, BW**
382	Jacobin Cuckoo	*Clamator jacobinus*	BM-C	BW, Ki
385	Klaas's Cuckoo	*Chrysococcyx klaas*	R/BM-C	Fo, BW, To
386	**Diederik Cuckoo**	***Chrysococcyx caprius***	**BM-VC**	**BW, Ki, Gr, Ko, Fy, To, Fa**
391	Burchell's Coucal	*Centropus burchellii*	R-C	BW, To, Wa
392	Barn Owl	*Tyto alba*	R-C	BW, Ki, Gr, Ko, Ds, Fy, RC, To, Fa
395	Marsh Owl	*Asio capensis*	R-C	Gr, Fa, Wa
396	African Scops Owl	*Otus senegalensis*	R-C	BW, Ki
397	Whitefaced Owl	*Ptilopsus granti*	R-C	BW, Ki
398	Pearlspotted Owl	*Glaucidium perlatum*	R-C	BW, Ki
401	Spotted Eagle Owl	*Bubo africanus*	R-C	Fo, BW, Ki, Gr, Ko, Ds, Fy, RC, To, Fa
402	Giant Eagle Owl	*Bubo lacteus*	R-U	BW, Ki
404	Eurasian Nightjar	*Caprimulgus europaeus*	R-U	BW, Ki, To, Fa
405	Fierynecked Nightjar	*Caprimulgus pectoralis*	R/BM-C	BW, Ki, To, Fa
406	Rufouscheeked Nightjar	*Caprimulgus rufigena*	BM-C	BW, Ki, Ko, Ds, Fa
408	Freckled Nightjar	*Caprimulgus tristigma*	R-C	RC
411	Eurasian Swift	*Apus apus*	NBM-C	BW, Ki, Gr, Ko, Ds, Fy, Mo, RC, To, Fa
412	Black Swift	*Apus barbatus*	R-C	BW, Ki, Gr, Ko, Ds, Fy, Mo, RC, To, Fa
415	Whiterumped Swift	*Apus caffer*	BM-VC	Ko, Ds, Mo, RC, To, Fa

Rob	English Name	Species	General Status	Habitats
416	Horus Swift	*Apus horus*	BM-LC	Gr, Mo, RC, Fa, Wa
417	Little Swift	*Apus affinis*	R/BM-VC	BW, Gr, Ko, Ds, Fy, Mo, RC, To, Fa
418	Alpine Swift	*Tachymarptis melba*	BM-C	BW, Ki, Gr, Ko, Ds, Fy, Mo, RC, Fa
421	Palm Swift	*Cypsiurus parvus*	R-C	BW, To
424	**Speckled Mousebird**	***Colius striatus***	**R-C**	**BW, To**
425	Whitebacked Mousebird	*Colius colius*	E-C	Ko, Ds, To
426	Redfaced Mousebird	*Urocolius indicus*	R-C	BW, Ko, Fy, To, Fa
428	Pied Kingfisher	*Ceryle rudis*	R-C	Wa, Ms
429	Giant Kingfisher	*Megaceryle maxima*	R-U	Wa, Ms
431	Malachite Kingfisher	*Alcedo cristata*	R-C	Wa
432	Pygmy Kingfisher	*Ispidina picta*	BM-LC	Fo, BW
433	Woodland Kingfisher	*Halcyon senegalensis*	BM-C	BW
435	**Brownhooded Kingfisher**	***Halcyon albiventris***	**R-C**	**Fo, BW, RC, To**
436	Greyhooded Kingfisher	*Halcyon leucocephala*	BM-U	BW
437	Striped Kingfisher	*Halcyon chelicuti*	R-C	BW
438	**Eurasian Bee-eater**	***Merops apiaster***	**NBM/BM-C**	**BW, Ki, Gr, Ko, Ds, Fa**
440	Bluecheeked Bee-eater	*Merops persicus*	NBM-LC	BW, Wa
441	Carmine Bee-eater	*Merops nubicoides*	NBM-LC	BW, Wa
443	Whitefronted Bee-eater	*Merops bullockoides*	R-C	BW, Wa
444	Little Bee-eater	*Merops pusillus*	R-C	BW, Wa
445	Swallowtailed Bee-eater	*Merops hirundineus*	R-LC	BW, Ki, Ko, Ds
446	Eurasian Roller	*Coracias garrulus*	NBM-C	BW, Ki, Gr, Fa
447	**Lilacbreasted Roller**	***Coracias caudata***	**R/LM-C**	**BW, Ki**
449	Purple Roller	*Coracias naevia*	R-U	BW, Ki
451	**African Hoopoe**	***Upupa africana***	**R(n)-C**	**BW, Ki, Ko, Ds, To, Fa**
452	Redbilled Woodhoopoe	*Phoeniculus purpureus*	R-C	Fo, BW, RC, To, Fa
454	Scimitarbilled Woodhoopoe	*Rhinopomastus cyanomelas*	R-C	BW, Ki
457	**Grey Hornbill**	***Tockus nasutus***	**R-C**	**BW, Ki**
458	Redbilled Hornbill	*Tockus erythrorhynchus*	R-C	BW
459	**Southern Yellowbilled Hornbill**	***Tockus leucomelas***	**Er-C**	**BW, Ki**
464	**Blackcollared Barbet**	***Lybius torquatus***	**R-C**	**Fo, BW, To, Fa**
465	Pied Barbet	*Tricholaema leucomelas*	Er-C	BW, Ki, Gr, Ko, Ds, To, Fa
470	**Yellowfronted Tinker Barbet**	***Pogoniulus chrysoconus***	**R-C**	**BW**
473	**Crested Barbet**	***Trachyphonus vaillantii***	**R-C**	**BW, To, Fa**
474	Greater Honeyguide	*Indicator indicator*	R-U	Fo, BW, Fa
476	Lesser Honeyguide	*Indicator minor*	R-LC	BW, To, Fa, Wa
478	Sharpbilled Honeyguide	*Prodotiscus regulus*	R-U	Fo, BW
481	Bennett's Woodpecker	*Campethera bennettii*	R-U	BW
483	Goldentailed Woodpecker	*Campethera abingoni*	R-C	Fo, BW, Ki, RC, To
486	**Cardinal Woodpecker**	***Dendropicos fuscescens***	**R-C**	**Fo, BW, Ki, Ko, Ds, Fy, RC, To, Fa**
487	Bearded Woodpecker	*Dendropicos namaquus*	R-C	BW
493	Monotonous Lark	*Mirafra passerina*	Er-C	BW, Ki
494	**Rufousnaped Lark**	***Mirafra africana***	**R-C**	**BW, Gr, Fa**
497	Fawncoloured Lark	*Calendulauda africanoides*	R-C	BW, Ki
498	Sabota Lark	*Calendulauda sabota*	Er-C	BW, Ki, Gr, Ko, Ds, RC
501	Shortclawed Lark	*Certhilauda chuana*	E-U	BW, Gr, Fa
505	Dusky Lark	*Pinarocorys nigricans*	NBM-U	BW
507	Redcapped Lark	*Calandrella cinerea*	R(n)-C	BW, Ki, Gr, Ko, Ds, Fy, Mo, Fa
508	Pinkbilled Lark	*Spizocorys conirostris*	Er-C	Ki, Gr, Ko, Fa
515	Chestnutbacked Finchlark	*Eremopterix leucotis*	R(n)-C	BW, Gr, Fa

Rob	English Name	Species	General Status	Habitats
518	Eurasian Swallow	*Hirundo rustica*	NBM-A	BW, Ki, Gr, Ko, Ds, Fy, Mo, To, Fa, Wa
520	Whitethroated Swallow	*Hirundo albigularis*	BM-C	Gr, RC, To, Fa
523	Pearlbreasted Swallow	*Hirundo dimidiata*	R/BM-C	BW, Fa
524	Redbreasted Swallow	*Hirundo semirufa*	BM-C	BW, Gr, Fa
526	**Greater Striped Swallow**	***Hirundo cucullata***	**BM-C**	**Ki, Gr, Ko, Fy, Mo, RC, To, Fa**
527	Lesser Striped Swallow	*Hirundo abyssinica*	R/BM-C	BW, RC, To, Fa
528	South African Cliff Swallow	*Hirundo spilodera*	Ebm-LC	BW, Gr, Fa
529	Rock Martin	*Hirundo fuligula*	R-C	Ki, Mo, RC, To, Fa
530	House Martin	*Delichon urbica*	NBM-LC	Gr, RC, Fa
532	Sand Martin	*Riparia riparia*	NBM-C	Gr, Fa, Wa
533	Brownthroated Martin	*Riparia paludicola*	R-C	Gr, Wa
534	Banded Martin	*Riparia cincta*	BM-U	Gr, Fa, Wa
538	Black Cuckooshrike	*Campephaga flava*	R-U	Fo, BW
541	**Forktailed Drongo**	***Dicrurus adsimilis***	**R-C**	**BW, Ki, RC, To, Fa**
543	Eurasian Golden Oriole	*Oriolus oriolus*	NBM-U	BW, Ki, Fa
545	**Blackheaded Oriole**	***Oriolus larvatus***	**R-C**	**Fo, BW, To, Fa**
547	Black Crow	*Corvus capensis*	R-C	BW, Gr, Ko, Ds, Mo, Fa
548	**Pied Crow**	***Corvus albus***	**R-A**	**BW, Gr, Ko, Ds, To, Fa**
552	Ashy Tit	*Parus cinerascens*	Er-U	BW, Ki
554	Southern Black Tit	*Parus niger*	Er-C	Fo, BW, To, Fa
557	Cape Penduline Tit	*Anthoscopus minutus*	Er-C	BW, Ki, Ko, Ds, Fy, Fa
558	Grey Penduline Tit	*Anthoscopus caroli*	R-C	BW
560	Arrowmarked Babbler	*Turdoides jardineii*	R-VC	BW, Fa
563	Pied Babbler	*Turdoides bicolor*	E-C	BW, Ki
567	Redeyed Bulbul	*Pycnonotus nigricans*	Er-VC	BW, Gr, Ko, Ds, To, Fa
568	**Blackeyed Bulbul**	***Pycnonotus tricolor***	**R-VC**	**BW, Mo, To, Fa**
576	Kurrichane Thrush	*Turdus libonyanus*	R-C	BW, To, Fa
577.1	Karoo Thrush	*Turdus smithi*	E-C	Fo, To, Fa
580	Groundscraper Thrush	*Psophocichla litsipsirupa*	R-C	BW, Ki, To, Fa
581	Cape Rockthrush	*Monticola rupestris*	E-C	RC
583	Shorttoed Rockthrush	*Monticola brevipes*	Er-U	RC, To
587	Capped Wheatear	*Oenanthe pileata*	R/BM-C	BW, Ki, Gr, Ko, Fa
589	Familiar Chat	*Cercomela familiaris*	R-C	BW, Ki, Gr, Ko, Ds, Fy, Mo, RC, To, Fa
593	Mocking Chat	*Thamnolaea cinnamomeiventris*	R-C	RC
595	Anteating Chat	*Myrmecocichla formicivora*	E-C	Ki, Gr, Ko, Fa
596	Stonechat	*Saxicola torquata*	R-VC	Gr, Fy, Mo, Fa
601	Cape Robin	*Cossypha caffra*	R-C	Fo, Fy, RC, To
602	Whitethroated Robin	*Cossypha humeralis*	E-C	BW
613	**Whitebrowed Robin**	***Cercotrichas leucophrys***	**R-C**	**BW**
615	Kalahari Robin	*Cercotrichas paena*	Er-C	BW, Ki
619	Garden Warbler	*Sylvia borin*	NBM-C	Fo, BW, To
620	Whitethroat	*Sylvia communis*	NBM-U	BW
621	Titbabbler	*Parisoma subcaeruleum*	Er-C	BW, Ki, Ko, Ds
625	Icterine Warbler	*Hippolais icterina*	NBM-C	BW, Ki
626	Olivetree Warbler	*Hippolais olivetorum*	NBM-U	BW
628	Great Reed Warbler	*Acrocephalus arundinaceus*	NBM-C	To, Fa, Wa
631	African Marsh Warbler	*Acrocephalus baeticatus*	BM-C	Wa
633	Eurasian Marsh Warbler	*Acrocephalus palustris*	NBM-C	Fo, BW, To, Wa
634	Eurasian Sedge Warbler	*Acrocephalus schoenobaenus*	NBM-C	Wa
635	Cape Reed Warbler	*Acrocephalus gracilirostris*	R-C	Wa

Rob	English Name	Species	General Status	Habitats
638	African Sedge Warbler	*Bradypterus baboecala*	R-C	Wa
643	Willow Warbler	*Phylloscopus trochilus*	NBM-VC	Fo, BW, Ki, To, Fa
645	**Barthroated Apalis**	***Apalis thoracica***	**R-C**	**Fo, BW, Fy, RC, To**
651	Longbilled Crombec	*Sylvietta rufescens*	R-C	BW, Ki, Ko
653	Yellowbellied Eremomela	*Eremomela icteropygialis*	R-U	BW, Ki, Ko, Ds
656	**Burntnecked Eremomela**	***Eremomela usticollis***	**R-C**	**BW**
657.1	Greybacked BleatingWarbler	*Camaroptera brevicaudata*	R-C	BW
658	Desert Barred Warbler	*Calamonastes fasciolatus*	Er-C	BW, Ki
664	**Fantailed Cisticola**	***Cisticola juncidis***	**R-VC**	**Gr, Fa**
665	Desert Cisticola	*Cisticola aridulus*	R-C	Gr, Fa
671	Tinkling Cisticola	*Cisticola rufilatus*	R-U	BW, Ki, Gr
672	**Rattling Cisticola**	***Cisticola chinianus***	**R-C**	**BW, Ki**
677	Levaillant's Cisticola	*Cisticola tinniens*	R-C	Gr, Fa, Wa
679	Lazy Cisticola	*Cisticola aberrans*	R-C	Fo, BW, Mo, RC
681	**Neddicky**	***Cisticola fulvicapillus***	**R-C**	**Fo, BW, Gr, Fy, RC, To, Fa**
683	**Tawnyflanked Prinia**	***Prinia subflava***	**R-C**	**BW, To, Fa, Wa**
685	Blackchested Prinia	*Prinia flavicans*	Er-C	BW, Ki, Gr, Ds, To, Fa
689	Spotted Flycatcher	*Muscicapa striata*	NBM-C	BW, Ki, Ko, To, Fa
693	Fantailed Flycatcher	*Myioparus plumbeus*	R-U	Fo, BW
694	Black Flycatcher	*Melaenornis pammelaina*	R-C	Fo, BW, To, Fa
695	Marico Flycatcher	*Bradornis mariquensis*	Er-C	BW, Ki
696	Pallid Flycatcher	*Bradornis pallidus*	R-C	BW
698	**Fiscal Flycatcher**	***Sigelus silens***	**E-C**	**BW, Ko, To**
701	**Chinspot Batis**	***Batis molitor***	**R-C**	**BW**
706	Fairy Flycatcher	*Stenostira scita*	E-C	BW, Ko, Fy, Mo, To, Fa
710	Paradise Flycatcher	*Terpsiphone viridis*	BM-C	Fo, BW, To, Fa
711	African Pied Wagtail	*Motacilla aguimp*	R-C	RC, To, Fa, Wa, Ms
713	Cape Wagtail	*Motacilla capensis*	R-C	Gr, Fy, To, Fa, Wa
714	Yellow Wagtail	*Motacilla flava*	NBM-U	Gr, Fa, Wa
716	**Grassveld Pipit**	***Anthus cinnamomeus***	**R-C**	**BW, Gr, Fa**
717	Longbilled Pipit	*Anthus similis*	R-C	Ko, Mo
718	**Plainbacked Pipit**	***Anthus leucophrys***	**R-C**	**Gr, Mo, Fa**
719	Buffy Pipit	*Anthus vaalensis*	R-U	Ki, Gr, Fa
720	Striped Pipit	*Anthus lineiventris*	R-LC	BW, RC
722	Tree Pipit	*Anthus trivialis*	NBM-U	BW
723	**Bushveld Pipit**	***Anthus caffer***	**R-LC**	**BW**
731	Lesser Grey Shrike	*Lanius minor*	NBM-C	BW, Ki, Gr
732	**Fiscal Shrike**	***Lanius collaris***	**R-C**	**BW, Ki, Gr, Ko, Ds, Fy, Mo, To, Fa**
733	**Redbacked Shrike**	***Lanius collurio***	**NBM-C**	**BW, Ki, Gr, Fa**
735	Longtailed Shrike	*Corvinella melanoleuca*	R-C	BW
736	Southern Boubou	*Laniarius ferrugineus*	E-C	Fo, BW, Fy, To
739	Crimsonbreasted Shrike	*Laniarius atrococcineus*	Er-C	BW, Ki, Ko, Ds
740	**Puffback**	***Dryoscopus cubla***	**R-C**	**Fo, BW**
741	Brubru	*Nilaus afer*	R-C	BW
743	**Threestreaked Tchagra**	***Tchagra australis***	**R-C**	**BW**
744	**Blackcrowned Tchagra**	***Tchagra senegala***	**R-C**	**BW**
748	Orangebreasted Bush Shrike	*Telophorus sulfureopectus*	R-C	BW
751	Greyheaded Bush Shrike	*Malaconotus blanchoti*	R-C	BW, To
753	**White Helmetshrike**	***Prionops plumatus***	**R-C**	**BW**
756	Whitecrowned Shrike	*Eurocephalus anguitimens*	Er-C	BW, Ki
760	Wattled Starling	*Creatophora cinerea*	R(n)-LA	BW, Ki, Gr, Ko, Ds, To, Fa

Rob	English Name	Species	General Status	Habitats
761	Plumcoloured Starling	*Cinnyricinclus leucogaster*	BM-U	BW
762	Burchell's Starling	*Lamprotornis australis*	Er-C	BW, Ki
764	**Glossy Starling**	***Lamprotornis nitens***	**Er-C**	**BW, Ki, Ko, Ds, To, Fa**
765	Greater Blue-eared Starling	*Lamprotornis chalybaeus*	R-C	BW
769	Redwinged Starling	*Onychognathus morio*	R-VC	Fy, Mo, RC, To, Fa
772	Redbilled Oxpecker	*Buphagus erythrorhynchus*	R-C	BW
779	Marico Sunbird	*Cinnyris mariquensis*	R-C	BW, To
787	**Whitebellied Sunbird**	***Cinnyris talatala***	**R-C**	**BW, To**
792	Black Sunbird	*Chalcomitra amethystina*	R-C	Fo, BW, To
796	Cape White-eye	*Zosterops virens*	E-VC	Fo, BW, Ko, Fy, To, Fa
798	Redbilled Buffalo Weaver	*Bubalornis niger*	R-LC	BW
799	**Whitebrowed Sparrowweaver**	***Plocepasser mahali***	**R-VC**	**BW, Ki, Fa**
801	**House Sparrow**	***Passer domesticus***	**R-VC**	**To, Fa**
802	Great Sparrow	*Passer motitensis*	R-U	BW, Ki, Ds
803	Cape Sparrow	*Passer melanurus*	Er-VC	BW, Ki, Ko, Ds, Fy, To, Fa
804	Southern Greyheaded Sparrow	*Passer diffusus*	Er-C	BW, Ki, Ko, To, Fa
805	Yellowthroated Sparrow	*Petronia superciliaris*	R-U	BW, Fa
806	Scalyfeathered Finch	*Sporopipes squamifrons*	Er-C	BW, Ki, Ko, Ds, Fa
811	Spottedbacked Weaver	*Ploceus cucullatus*	R-VC	Fo, BW, To, Fa
814	**Masked Weaver**	***Ploceus velatus***	**R-C**	**BW, Ki, Gr, Ko, Ds, Mo, To, Fa, Wa**
815	Lesser Masked Weaver	*Ploceus intermedius*	R-LC	BW, To, Wa
819	Redheaded Weaver	*Anaplectes rubriceps*	R-C	BW
820	Cuckoofinch	*Anomalospiza imberbis*	R/BM-U	BW, Gr, Fa
821	Redbilled Quelea	*Quelea quelea*	R(n)-LA	BW, Ki, Gr, Fa
824	Red Bishop	*Euplectes orix*	R-C	Gr, To, Fa, Wa
826	Golden Bishop	*Euplectes afer*	R(n)-LC	Gr, Fa, Wa
829	Whitewinged Widow	*Euplectes albonotatus*	R(n)-LC	BW, Gr, Fa
831	Redcollared Widow	*Euplectes ardens*	R(n)-LC	BW, Gr, Mo, Fa
834	Melba Finch	*Pytilia melba*	R-C	BW, Ki, Ko, Ds
840	Bluebilled Firefinch	*Lagonosticta rubricata*	R-C	Fo, BW, To, Fa
841	Jameson's Firefinch	*Lagonosticta rhodopareia*	R-C	BW, Fa
842	**Redbilled Firefinch**	***Lagonosticta senegala***	**R-C**	**BW, Gr, Ko, To, Fa**
844	**Blue Waxbill**	***Uraeginthus angolensis***	**R-C**	**BW, To, Fa**
845	Violeteared Waxbill	*Granatina granatina*	Er-LC	BW, Ki, Fa
846	Common Waxbill	*Estrilda astrild*	R-C	Gr, To, Fa, Wa
847	Blackcheeked Waxbill	*Estrilda erythronotos*	R-LC	BW, Ki
852	Quail Finch	*Ortygospiza atricollis*	R-C	Gr
854	Orangebreasted Waxbill	*Amandava subflava*	R-LC	Gr
855	Cutthroat Finch	*Amadina fasciata*	R(n)-U	BW, Ki
856	Redheaded Finch	*Amadina erythrocephala*	Er-VC	Gr, Fa
857	**Bronze Mannikin**	***Lonchura cucullata***	**R-VC**	**Fo, BW, To, Fa**
860	Pintailed Whydah	*Vidua macroura*	R(n)-C	BW, Gr, To, Fa
861	Shafttailed Whydah	*Vidua regia*	Er-C	BW, Ki, Ko
862	Paradise Whydah	*Vidua paradisaea*	R-C	BW, To, Fa
864	Black Widowfinch	*Vidua funerea*	R(n)-LC	BW, To, Fa
865	Purple Widowfinch	*Vidua purpurascens*	R-U	BW, Fa
867	Steelblue Widowfinch	*Vidua chalybeata*	R(n)-C	BW, To, Fa
869	**Yelloweyed Canary**	***Serinus mozambicus***	**R-C**	**Fo, BW, To, Fa**
870	Blackthroated Canary	*Serinus atrogularis*	R-C	BW, Ki, Gr, Ko, Ds, Fy, To, Fa
878	Yellow Canary	*Serinus flaviventris*	Er-C	Ki, Gr, Ko, Ds, Fy, Mo, To, Fa

Rob	English Name	Species	General Status	Habitats
881	**Streakyheaded Canary**	***Serinus gularis***	**R-C**	**Fo, BW, Gr, Mo, To, Fa**
884	**Goldenbreasted Bunting**	***Emberiza flaviventris***	**R-U**	**BW, To, Fa**
885	Cape Bunting	*Emberiza capensis*	R-C	Ko, Ds, Fy, Mo, RC
886	Rock Bunting	*Emberiza tahapisi*	R(n)-LC	Mo, RC
887	Larklike Bunting	*Emberiza impetuani*	Er-VC	Ko, Ds, Fy

Table 20: Abbreviation explanations for Table 19.

Status	Occurrence	Endemic Status	Red Data Species	Habitats
R = Resident **BM** = Breeding Migrant **NBM** = Non-breeding migrant **V** = Vagrant	**A** = Abundant **VC** = Very Common **C** = Common **U** = Uncommon **R** = Rare	**E** = wholly endemic species **Er** = species with range largely confined to Southern Africa **Es** = endemic sub-species which is potentially a full species **Ebr** = species with breeding range wholly confined to Southern Africa.	**RE** = regionally extinct **CR** = critically endangered **EN** = endangered **VU** = vulnerable **NT** = near threatened.	**Fo** = Forest **BW** = Bushveld and Woodland **Ki** = Kalahari **Gr** = Grassland **Ko** = Karoo **Ds** = Desert **Fy** = Fynbos **Mo** = Mountains **RC** = Rocks and Cliffs **To** = Towns and Gardens **Fa** = Farmland **Wa** = Wetland (Inland Water) **Mp** = Marine pelagic **Ms** = Marine Shoreline

Table 21: Reptilian species list for the region that incorporates the proposed development area.

Name	Species	RDL Status	Endemic status
Leopard tortoise	*Geochelone pardalis*		
Serrated or Kalahari tent tortoise	*Psammobates oculiferus*	Endem	1
Lobatse hinged tortoise	*Kinixys labatsiana*	Endem	1
Marsh (=Helmeted) terrapin	*Pelomedusa subrufa*		
Serrated hinged terrapin	*Pelusios sinuatus*		
Delalande's beaked blind snake	*Rhinotyphlops lalandei*	Endem	1
Cape thread snake	*Leptotyphlops conjuctus incognitus*		
Peter's thread snake	*Leptotyphlops scutifrons scutifrons*	Endem	1
Southern African python	*Python natalensis*	VU	
Southern or Bibron's burrowing asp	*Atractaspis bibronii*		
Duerden's or beaked burrowing asp	*Atractaspis duerdeni*	Endem	1
Cape centipede eater	*Aparallactus capensis*		
Common purple-glossed snake	*Amblyodipsas polylepis polylepis*		
Bicoloured quill-snouted snake	*Xenocalamus bicolor bicolor*		
Common brown water snake	*Lycodonomorphus rufulus*	Endem	1
Brown house snake	*Lamprophis capensis (=fuliginosus)*		
Cape wolf snake	*Lycophidion capense capense*		
Southern (=Cape) file snake	*Mehelya capensis capensis*		
Mole snake	*Pseudoaspis cana*		
Two-stripe shovel-snout	*Prosymna bivittata*	Endem	1
Striped skaapsteker	*Psammophyllax tritaeniatus*		
Fork-marked sand snake	*Psammophis leightoni trinasalis*	Endem	1
Short-snouted grass snake	*Psammophis brevirostris brevirostris*		
Stripe-bellied sand snake	*Psammophis subtaeniatus subtaeniatus*		
Spotted bush snake	*Philothamnus semivariegatus*		

Name	Species	RDL Status	Endemic status
Green water snake	*Philothamnus hoplogaster*		
Common or Rhombic egg-eater	*Dasypeltis scabra*		
Eastern green snake	*Philothamnus natalensis occidentalis*	Endem	2
Herald snake	*Crotaphopeltis hotamboeia*		
Common (=Eastern) tiger snake	*Telescopous semiannulatus semiannulatus*		
Boomslang	*Dispholidus typus typus*		
Vine or twig snake	*Thelotornis capensis capensis*		
Shield-nose snake	*Aspidelaps scutatus scutatus*	Endem	1
Boulenger's garter snake	*Elapsoidea boulengeri*		
Snouted (=Egyptian) cobra	*Naja annulifera annulifera*		
Mozambique spitting cobra (=M'fezi)	*Naja mossambica*		
Black mamba	*Dendroaspis polylepis*		
Puff adder	*Bitis arietans arietans*		
Cape spade-snouted worm lizard	*Monopeltis capensis*	Endem	1
Dusky spade-snouted worm lizard	*Monopeltis infuscata*		
Blunt-tailed worm lizard	*Dalophia pistillum*		
Cape skink	*Mabuya capensis*		
Striped skink	*Mabuya striata punctatissima*		
Variable skink	*Mabuya varia*		
Spotted-neck snake-eyed skink	*Panaspis sp.*		
Wahlberg's snake-eyed skink	*Panaspis wahlbergii*		
Bushveld lizard	*Heliobolus lugubris*		
Common rough-scaled lizard	*Ichnotropis squamulosa*		
Spotted sandveld lizard	*Nucras intertexta*	Endem	1
Holub's sandveld lizard	*Nucras holubi*		
Spotted sand lizard	*Pedioplanis lineoocellata lineooccellata*	Endem	1
Yellow-throated plated lizard	*Gerrhosaurus flavigularis*		
Tropical girdled lizard	*Cordylus tropidosternum jonesi*		
Transvaal girdled lizard	*Cordylus vittifer*		
Rock (=White-throated) monitor	*Varanus albigularis albigularis*		
Nile (=Water) monitor	*Varanus niloticus*		
Ground agama	*Agama aculeata distanti*		
Southern rock agama	*Agama atra atra*	Endem	1
Flap-neck chameleon	*Chamaeleo dilepis*		
Moreau's tropical house gecko	*Hemidactylus mabouia*		
Wahlberg's velvet gecko	*Homopholis wahlbergi*	Endem	1
Cape dwarf gecko	*Lygodactylus capensis capensis*		
Transvaal thick-toed gecko	*Pachydactylus affinis*	Endem	2
Cape thick-toed gecko	*Pachydactylus capensis*	Endem	1
Turner's thick-toed gecko	*Pachydactylus turneri*		
Nile crocodile	*Crocodylus niloticus*		

***Endemic status= 1: southern Africa; 2: South Africa.**

Table 22: Amphibian species list for the region that incorporates the proposed development site.

English name	Species	RDL status
Platanna, Common	*Xenopus laevis*	
Rubber frog, Banded	*Phrynomantis bifasciatus*	
Shovel-nosed frog, Mottled	*Hemisus marmoratus*	
Kassina, Bubbling	*Kassina senegalensis*	
Frog, Foam nest	*Chiromantis xerampelina*	
Rain frog, Bushveld	*Breviceps adspersus*	
Bullfrog, Giant	*Pyxicephalus adspersus*	VU
Frog, Ornate	*Hildebrandtia ornata*	
Sand frog, Tremolo	*Tomopterna cryptotus*	
Sand frog, Knocking	*Tomopterna krugerensis*	
Sand frog, Natal	*Tomopterna natalensis*	
Toad, Raucous	*Bufo rangeri*	
Toad, Guttural	*Bufo gutturalis*	
Toad, Flat-backed	*Bufo maculatus*	
Toad, Western olive	*Bufo poweri*	
Pygmy toad, Northern	*Bufo fenoulheti*	
Toad, Red	*Schismaderma carens*	
Grass frog, Plain	*Ptychadena anchietae*	
Grass frog, Broad-banded	*Ptychadena mossambica*	
Caco, Common	*Cacosternum boettgeri*	
Puddle frog, Snoring	*Phrynobatrachus natalensis*	

Table 23: Scorpion species list for the region that incorporates the proposed development area (Leeming, 2003).

Species	Species
Family: Buthidae	**Family: Ischnuridae**
Parabuthus granulatus	*Opistacanthus asper*
Parabuthus mossambicensis	*Opistacanthus validus*
Parabuthus leavipes	*Opistacanthus capensis*
Parabuthus raudus	*Cheloctonus jonesii*
Parabuthus schlechteri	*Hadogenes gunningi*
Parabuthus capensis	*Hadogenes phyllodes*
Parabuthus namibensis	*Hadogenes gracilis*
Parabuthus transvaalicus	*Hadogenes tityrus*
Parabuthus stridulus	*Hadogenes zuluanus*
Pseudolychas pegleri	*Hadogenes troglodytes*
Uroplectes planimanus	*Hadogenes zumpti*
Uroplectes olivaceus	*Hadogenes minor*
Uroplectes carinatus	**Family: Scorpionidae**
Uroplectes vittatus	*Opistophthalmus glabrifrons*
Uroplectes triangulifer	*Opistophthalmus pugnax*
Uroplectes formosa	*Opistophthalmus carinatus*
Uroplectes lineatus	*Opistophthalmus holmi*
Uroplectes variegatus	*Opistophthalmus fitzsimonsi*
Uroplectes insignis	

Table 24: Mygalomorph spider species list for the region that incorporates the proposed development area (Dippenaar-Schoeman, 2002).

Species
Family: Ctenizidae (Cork-lid trapdoor spiders
Stasimopsis coronatus
Family: Cyrtaucheniidae (Wafer-lid trapdoor spiders)
Ancylotrypa nuda
Family: Idiopidae (Front-eyed trapdoor spiders)
Galeosoma pluripunctatum
Idiops pullus
Family: Migidae (Tree trapdoor spiders)
Moggridgea paucispina

Appendix C - RDL faunal species recorded for North West Province.

Table 25: RDL Faunal species recorded for North West Province (NWP SoER, 2002).

Species	English Name	RDL Status	Conservation notes
MAMMALS			
Lycaon pictus	Wild Dog	EN	Small packs occasionally come across into the northwestern part of the province but these are soon exterminated (Stuart 1981). Stable populations occur only in the Kruger National Park and recently a group was reintroduced into Madikwe Nature reserve.
Mystromys albicaudatus	White-tailed Mouse	VU	This species is fairly widespread in the eastern and southern part of the province. Although widespread it is by no means common and its greatest threat is habitat modification due to agriculture. It has been recorded from a number of reserves including Barberspan, S.A. Lombard and Boskop Dam.
Mellivora capensis capensis	Honey Badger	VU	A widespread secretive species but nowhere common throughout its range. It is often killed through the indiscriminate use of getters and poisons such as strychnine. It occurs and is protected on nature reserves such as Pilanesberg, Molopo and Madikwe, Rustenburg Nature Reserve and possibly occurs on Borakalalo National Park.
Felis lybica	African Wild Cat	VU	Widely distributed throughout the North West Province and South Africa. The reason for the inclusion in this category is that they freely hybridize with domestic cats and it has now become very difficult, if not impossible to find pure strains of *Felis lybica* wherever Felis domesticus occurs. The presence of domestic cats in and around protected natural areas should be very carefully monitored and controlled.
Manis temminckii	Pangolin	VU	Occurs throughout large areas of the province but nowhere is it common. The scales are in much demand by witchdoctors. Habitat modification and their sensitivity to poisons are reasons for their decline.
Orycteropus a. afer	Aardvark	VU	Occurs virtually throughout the whole of South Africa. Its greatest threat is habitat modification while they are often killed by farmers because of the potential threat to vehicles and livestock posed by their large burrow entrances and often killed for their palatable flesh and muti properties.
Diceros bicornis	Black Rhinoceros	VU	Formerly widespread throughout most of South Africa, this species now only survives in island reserves and protected natural areas. Poaching is a very real threat and because of their size and habits they can only be accommodated on large natural areas such as Pilanesberg.
Hippotragus niger niger	Sable Antelope	VU	Occurs only on reserves such as Pilanesberg and Rustenburg and a few private nature reserves in the province. Their numbers have declined chiefly because of over exploitation in the past and because of habitat modification and subdivision of land coupled with the erection of fences in the recent past.
The following list of animals are all classified as rare for various reasons but the chief threat communal to them all is habitat modification. Animals such as the leopard and the hippopotamus are hunted because of their potential threat to humans and livestock and to a lesser degree this is also the case, combined with ignorance, for brown hyaena, aardwolf, civet and serval.			
Atelerix frontalis	Hedgehog	RA	
Zelotomys woosnami	Woosnam's Desert Rat	RA	
Graphiurus ocularis	Spectacled Dormouse	RA	
Poecilogale albinucha albinucha	African Striped Weasel	RA	
Civettictis civetta	African Civet	RA	
Proteles cristatus cristatus	Aardwolf	RA	
Hyaena brunnea	Brown Hyaena	RA	

Species	English Name	RDL Status	Conservation notes
Felis serval serval	Serval	RA	
Felis nigripes nigripes	Small Spotted Cat	RA	
Panthera pardus	Leopard	RA	
Hippopotamus amphibius	Hippopotamus	RA	
Damaliscus lunatus lunatus	Tsessebe	RA	
The following species have been placed in this category because at this stage there is insufficient information to judge their status.			
Crocidura maquassiensis	Maquassie Musk Shrew	DD	
Suncus lixus	Greater Dwarf Shrew	DD	
Suncus infinitesimus	Lesser Dwarf Shrew	DD	
Pipistrellus kuhlii	Kuhl's Bat	DD	
Rhinolophus denti	Dent's Horseshoe Bat	DD	
Cleotis percivali	Short-eared Trident Bat	DD	
BIRDS			
The following birds from the North West Province are listed in the Red Data Book (R.K. Brooke 1984), note that the 18 species labelled (F) were formerly recorded in the Province but since 1970 have never been seen again.			
Neophron percnopterus	Egyptian Vulture (F)	EN	
Grus carunculata	Wattled Crane (F)	EN	
Botaurus stellaris	Bittern (F)	VU	
Gyps coprotheres	Cape Vulture	VU	
Torgos tracheliotus	Lappet-faced Vulture	VU	
Polemaetus bellicosus	Martial Eagle	VU	
Terathopius ecaudatus	Bateleur (F)	VU	
Ardeotis kori	Kori Bustard	VU	
Neotis ludwigii	Ludwig's Bustard (F)	VU	
Gorsachius leuconotus	White-backed Night Heron (F)	DD	
Ixobrychus sturmii	Dwarf Bittern (F)	DD	
Ciconia nigra	Black Stork	DD	
Phoenicopterus minor	Lesser Flamingo	DD	
Porzana pusilla	Baillon's Crake	DD	
Podica senegalensis	African Finfoot (F)	DD	
Pterocles gutturalis	Yellow-throated Sandgrouse (F)	DD	
Tyto capensis	Grass Owl	DD	
Apus bradfieldi	Bradfield's Swift	DD	
Mirafra chuana	Short-clawed Lark	DD	
Charadrius pallidus	Chestnut-banded Plover	R	
Glareola pratincola	Red-winged Pratincole	R	
Ixobrychus minutes	Little Bittern (F)	R	

Species	English Name	RDL Status	Conservation notes
Anastomus lamelligerus	Open-billed Stork	R	
Ephippiorhynchus senegalensis	Saddle-billed Stork (F)	R	
Leptoptilos crumeniferus	Marabou Stork	R	
Mycteria ibis	Yellow-billed Stork	R	
Gypaetus barbatus	Bearded Vulture (F)	R	
Gypohierax angolensis	Palmnut Vulture (F)	R	
Falco peregrinus	Peregrine Falcon	R	
Sarothrura ayresi	White-winged Flufftail (F)	R	
Charadrius pallidus	Chestnut-banded Plover	R	
Glareola pratincola	Red-winged Pratincole	R	
Anthus brachyurus	Short-tailed Pipit	R	
Geronticus calvus	Bald Ibis (F)	LC	
Phoenicopterus rubber	Greater Flamingo (F)	LC	
REPTILES			
Python sebae natalensis	African Rock Python	VU	Habitat modification and human ignorance are possibly the two greatest threats to this snake. It is partially protected by legislation and occurs on several reserves in the province.
Dalophia pistillum	Blunt-tailed Worm-lizard	RA	There is only one record for this reptile in the North West Province but it is probably more common and widespread. This will be established with some serious collecting but, as with most of the smaller animals, habitat modification is a real threat.
FISH			
Three species of fish that have been recorded from the Province's rivers are listed in the Red Data Book (Skelton, 2001). These are the following:			
Species	**English Name**	**RDL Status**	**Conservation notes**
Barbus motebensis	Marico Barb	VU	Confined to the headwater tributaries of the Marico and Crocodile Rivers.
Labeobarbus kimberleyensis	Orange-Vaal largemouth yellowfish	VU	Endemic to the larger tributaries of the Orange-Vaal River system where it is becoming scarce.
Austroglanis sclateri	Rock-catfish	LC	Endemic to the Vaal-Orange River system, is threatened by the industrial and urban pollution of the rivers.
INSECTS			
There are only two insects that occur in the North West Province listed in the Red Data Book series for South Africa and both are butterflies. Both are listed under the category indeterminate.			
Metisella meninx (Family Hesperiidae)	Marsh Sylph	DD	Discovered near Potchefstroom in 1868. It inhabits marshy streams and many of its localities have since been destroyed. It has yet to be determined if this species occurs on any nature reserve.
Acraea machequena (Family Acraeidae)		DD	A marginal species that migrates into South Africa periodically from the north and east occasionally reaching Brits. There being apparently no permanent populations there can be no threats.

Appendix D – Environmental Management Plan for the proposed Eskom Holdings Limited Dwaalboom Switching Station development.

1. Introduction.

The Eskom Holdings Limited Dwaalboom Switching Station development is proposed within the north-eastern area of the North West Province. Three possible localities are presented within the area where the substation could be constructed. Following an ecological survey of the three sites during December 2008, it was found that construction within Site B would have the least negative ecological impacts on the conservation of biodiversity within the region. Construction activities within this area would, however, still impinge on the ecological integrity and therefore certain measures need to be taken into consideration during the various phases of the proposed development activities. The following is an Environmental Management Plan (EMP) that has been developed as mitigation against potential environmental impacts related to the proposed ESKOM Dwaalboom substation development.

Mitigation measures are actions needed to align a project implementation phase with environmental control principles. During its lifecycle, projects journey through four distinctive phases, namely *Planning*, *Construction*, *Operations* and *Decommissioning* phases. The EMP is accordingly separated into measures dealing with the various project phases. The phases applicable to this proposed development will largely be limited to *Planning, Construction* and *Operations*.

The impacts on the environment can only be minimised by the dedicated and sincere implementation of the EMP by the Contractor. The Client will be responsible for ensuring compliance by the Contractor, during the construction phase, with the findings of the EMP. Compliance with the EMP must be audited monthly during the construction phase and once immediately following completion of the project.

1.1. Project activities.

The proposed project involves the removal of all vegetation within a certain area as the area has not been historically developed. There is an existing powerline running in association with the proposed development site. Servitudes for this powerline had been cleared and therefore a certain amount of vegetation stripping has already taken place. The proposed development site is situated adjacent to this area and therefore removal of vegetation will still be necessary. The

construction of a switching station is then to take place, together with the associated servitudes and services.

1.2. Construction phase.

The main construction activities will include the following:

- Site preparation;
- Earthworks (excavations, etc.);
- Construction of the switching station, roads and services; and
- Site reinstatement and landscaping of surrounding areas that suffered environmental degradation during the construction phase.

2. Enforcement

The responsibility for enforcing the implementation of the EMP lies with the client. It is the responsibility of the Environmental Control Officer (ECO) to monitor the Principal Contactor.

The ECO is responsible for the following:

- To monitor the execution of the mitigation measures, and to ensure the safeguarding of the environment;
- To facilitate communication between I&AP's (Interested and Affected Parties), Consultants and the Contractor;
- To inspect the construction site on a weekly basis, and to prepare a monitoring report which will be forwarded to the project team, the local municipality and representatives from the I&APs (i.e. community members).
- To train the Contractor, Site Agent, Construction Supervisor and Safety Officer on the mitigation measures, and to verify that the Contractor's employees have undergone induction on these measures.

The abovementioned monitoring report will include a **checklist** and an **issues list**. The checklist will be completed by awarding the following scores, based on the level of compliance

COMPLIANCE SCORES	DESCRIPTION
1	Task not achieved
2	Task 20% completed
3	Task 50% completed
4	Task 80 % completed
5	Task 100% completed

Where non-compliance is encountered (i.e. COMPLAINCE SCORE < 5), the significance of the associated impact will be recorded, based on the following guidelines:

IMPACT SCORES	IMPACT
1	**Low** – mitigation not needed
2	**Medium** – mitigation should be considered
3	**High** – mitigation compulsory

The issues list will highlight the most pertinent issues that require mitigation, and provide the deadline for compliance. The following EMP was compiled to mitigate against any negative impacts identified in the Basic Assessment Report.

3. Mitigation measures.

In the EMP tables below, general mitigation measures are provided for the planning phase, while specific measures are listed to address the identified environmental impacts during the construction and operation stages of the project. This EMP should be made binding to the contract.

PROJECT PHASE: PLANNING

Environmental Consideration	Mitigation Measures	Responsible Party
EMP Induction	Introduce the ECO* to the Project Team.	Project Manager
	Training of the Contractor's employees on the EMP and RoD.	ECO
	Explanation of environmental monitoring protocol to the Project Team by the ECO.	ECO
	All correspondence from ECO must be filed and kept onsite.	Project Manager
Construction Camp	Make provision for enough chemical toilets for all employees.	Project Manager; Contractor
	In consultation with the ECO, establish a suitable site for a construction camp.	
Waste	Identify suitable landfill, which will accept the type of waste material to be generated.	Project Manager; Contractor
Soil	Identify suitable site/burrow pit (if applicable) to obtain soil. All new borrow pits, or extensions to existing pits, require an Environmental Management Programme Report (EMPR) in terms of the Minerals Act (Act no. 50 of 1991).	Project Manager
Social	Labour intensive methods must be used where feasible, cost effective and not time constraining.	Contractor
	Local labour should be employed were possible.	Contractor
	Local suppliers must be used, as far as possible.	Contractor

* ECO – Environmental Control Officer

4. Significance ratings of perceived environmental impacts.

Table 26: Significance assessment of the perceived major environmental impacts both before and after mitigation measures that are applicable to the proposed development activities.

Potential environmental impact	Project activity or issue	Environmental significance ***before*** mitigation								Environmental significance ***after*** mitigation as per EMP							
		S	D	I	P	E	R	Conf	SP	S	D	I	P	E	R	Conf	SP
PRECONSTRUCTION & CONSTRUCTION PHASES																	
Habitat destruction	Vegetation removal and soil stripping leading to habitat loss.	1	3	3	4	2	2	High	26	1	3	3	4	2	2	High	26
Biodiversity impacts	Impact on protected tree species.	2	5	3	5	3	2	High	53	2	5	3	5	3	2	High	53
Biodiversity impacts	Habitat destruction that would lead to decreased potential to support biodiversity.	2	3	1	4	2	2	High	22	2	3	1	4	2	2	High	22
Biodiversity impacts	Subsistence hunting & gathering of natural resources by labour.	2	4	3	3	3	1	High	32	2	4	1	1	1	3	High	2
Compaction of soils	Movement of heavy machinery leading to soil compaction.	1	1	3	4	2	2	High	18	1	1	3	4	2	2	High	18
Soil contamination	Pollution of soils due to oil/fuel leaks & wastes.	2	4	3	2	2	4	High	10	2	4	1	1	2	4	High	1
Soil erosion	Stockpiled topsoil & disturbed soils due to vegetation stripping leading to soil erosion.	2	1	1	2	1	3	High	1	2	1	1	2	1	3	High	1
CONSTRUCTION PHASE																	
Biodiversity impacts	Subsistence hunting & gathering of natural resources by labour.							High	32	2	4	1	1	1	3	High	2
Compaction of soils	Movement of heavy machinery leading to soil compaction.							High	18	1	1	3	4	2	2	High	18
Soil contamination	Pollution of soils due to oil/fuel leaks & wastes. Oil leaks from transformers.							High	10	2	4	1	1	2	4	High	1
DECOMMISSIONING PHASE																	
Biodiversity impacts	Subsistence hunting & gathering of natural resources by labour.							High	32	2	4	1	1	1	3	High	2
Compaction of soils	Movement of heavy machinery leading to soil compaction.							High	18	1	1	3	4	2	2	High	18
Soil contamination	Pollution of soils due to oil/fuel leaks & wastes. Oil leaks from transformers.							High	10	2	4	1	1	2	4	High	1
Exotic vegetation encroachment.	Exotic vegetation encroachment following decommissioning & lack of ongoing management of exotic vegetation.							High	45	2	1	1	2	2	3	High	3

[Significance of Environmental Impact (SP) = Consequence x Probability (P),
where Consequence = {[Spatial extent (S) + Duration (D) + Intensity (I) + Effects on important ecosystems (E)] - Reversibility (R)} X Probability (P).
SP ratings: 0-33 (Low), 34-74 (Medium), 75-100 (High)

Table 26 presents the significance assessment of the perceived environmental impacts for the pre-construction, construction, operational and decommissioning phases of the proposed development that are applicable to maintenance of ecological integrity of the areas affected by the proposed development activities.

The majority of the perceived impacts are viewed as being of *low* significance before mitigation. Those that are perceived as posing a *medium* perceived significance rating could largely be reduced to *low* significance with the appropriate mitigation measures. The loss of the protected tree species is largely unavoidable if the proposed development activity does take place.

PROJECT PHASE: CONSTRUCTION

Environmental Consideration	Environmental Impacts	Mitigation Measures	Time Frames	Responsible Party
1) Soils	• Topsoil will be stripped and stockpiled during the excavation. • During the period of stockpiling the topsoil may be exposed to erosion.	• Removal of vegetation must be restricted to the works area. • In areas to be affected by construction activities, topsoil (minimum of 300mm of top layer) is to be stored. • Careful excavation accompanied by appropriate construction methods and rehabilitation measures will help to prevent erosion. • Protect stockpiled topsoil by preventing compaction (vehicle movement), contamination and mixing with any other material i.e. building rubble, excess building material, solid wastes, etc. • Soils that have been stockpiled are to be properly reinstated to their original location following completion of the construction phase of the development activities. Landscaping of the area to emulate the original topography must be implemented needs to be landscaped to emulate original contours and topography. • The Contractor must implement adequate erosion control measures for areas of fragile soils, especially within areas of steeper gradients. • Institute wind and water erosion-control measures to prevent loss of topsoil by the strategic placement of baffles, gabions, vegetation, etc. • All contour embankments crossed by the works must be rehabilitated and landscaped to their previous state.	Continuous throughout the construction phase	Contractor

Environmental Consideration	Environmental Impacts	Mitigation Measures	Time Frames	Responsible Party
1) Soils **(cont)**	• Soils may become compacted though heavy machinery movement and constant construction vehicle traffic.	• Compacted areas to be scarified to allow for penetration of root systems with care being taken to prevent soil erosion. • Only the existing access roads to be used to avoid unnecessary destruction of vegetation and compaction of soils.	Continuous throughout the construction phase	Contractor
	• During the construction phase the land may be polluted by contaminants such as fuel and and/or waste (domestic, construction material, human).	• Waste to be managed. Suitable waste receptacles (e.g. bins, skips) to be provided at the construction camp. • Sufficient chemical toilets to be provided – 1 toilet per 20 workers. Chemical toilets to be serviced once per week. • Elevated fuel storage tanks to be provided with impermeable floors and bund walls to prevent pollution during accidental spillages. The outflow of the bunded area to be supplied with an oil trap. The bund wall to be of sufficient height to allow for the containment of 110% of the tank(s) volume. Provide area with relevant warning signage (e.g. no smoking and open fires, fire extinguisher). • Topsoil stockpiles must not be contaminated with oil, diesel, petrol, waste or any other foreign matter, which may inhibit the later growth of vegetation and micro-organisms in the soil. • Where soil pollution has occurred (e.g. with fuel or oil), the degree of contamination and depth of soil percolation needs to be assessed and the contaminated layers need to be removed and disposed of at a permitted landfill site.		

Environmental Consideration	Environmental Impacts	Mitigation Measures	Time Frames	Responsible Party
2) Groundwater	• Groundwater may be contaminated through percolation of contaminants.	• Waste to be managed. Suitable waste receptacles (e.g. bins, skips) to be provided at the construction camp. • Sufficient chemical toilets to be provided – 1 toilet per 20 workers. Chemical toilets to be serviced once per week. • Elevated fuel storage tanks to be provided with impermeable floors and bund walls to prevent pollution during accidental spillages. The outflow of the bunded area to be supplied with an oil trap. The bund wall to be of sufficient height to allow for the containment of 110% of the tank(s) volume. Provide area with relevant warning signage (e.g. no smoking and open fires, fire extinguisher). • Prevent spillage from elevated fuel tanks during decanting.	Continuous throughout the construction phase.	Contractor
3) Fauna	• Damage to fauna (e.g. poaching, wilful damage).	• No animal may be snared, captured or wilfully damaged or destroyed, unless declared as a pest by the ECO. • Disturbances to nesting sites of birds must be avoided, as far as possible. • Animal movement must not be hindered. • All labourers to remain inside construction footprint. • All labourers to be informed of disciplinary actions for the wilful damage to animals.	Continuous throughout the construction phase.	Contractor; ECO
	• Storing of domestic waste may lead to occurrence of pests, such as rodents, flies, etc.	• Waste to be managed. Suitable waste receptacles (e.g. bins, skips) to be provided at the construction camp.	Waste receptacles must be put in place before construction starts, be emptied on a daily basis and disposed at a registered landfill.	Contractor
4) Flora	• Damage to plant life. • Removal of protected tree species	• Workers and machinery to remain inside construction footprint. All labourers to be informed of disciplinary actions for the wilful damage to plants. • Application to DWAF for appropriate licence permits. • Proposed development activities should take into consideration the locality of the larger and well-established trees and potentially incorporate these into the development.	Continuous throughout the construction phase.	Contractor

Environmental Consideration	Environmental Impacts	Mitigation Measures	Time Frames	Responsible Party
	• Exotic species can be introduced into new areas by importing topsoil and disturbing open areas.	• The spreading of alien species is to be prevented through the utilisation of local topsoil and controlled through a proper herbicide maintenance plan. Care needs to be exercised during herbicidal application to prevent surface water contamination. • Only indigenous vegetation to be used during landscaping. • Rehabilitation to include the following: 1. Importing topsoil; 2. Seeding with those species listed as being typical of the vegetation type and unit (presented in Table 4); 3. Fertiliser application done sparingly so as not to contaminate the surface waters during rainfall events; 4. Planting of indigenous trees of appropriate species that are representative of the vegetation type (Table 4); 5. Irrigation to be carefully applied until adequate vegetation cover of the bare soils is reached to prevent soil erosion; and 6. Landscaping of affected areas, with appropriate revegetation measures applied (described above).	Continuous throughout the construction phase.	Contractor
	• Pollution of soil will adversely affect vegetation.	• Rehabilitation to include the following: 1. Importing topsoil; 2. Seeding with those species listed as being typical of the vegetation type and unit (presented in Table 4); 3. Fertiliser application done sparingly so as not to contaminate the surface waters during rainfall events; 4. Planting of indigenous trees of appropriate species that are representative of the vegetation type (Table 4); 5. Irrigation to be carefully applied until adequate vegetation cover of the bare soils is reached to prevent soil erosion; and 6. Landscaping of affected areas, with appropriate revegetation measures applied (described above).	Continuous throughout the construction phase.	Contractor

PROJECT PHASE: OPERATION

Where applicable, the mitigation measures for the construction phase will be carried forward to the operations phase. In addition, the following specific measures will also apply:

Environmental Consideration	Environmental Impacts	Mitigation Measures	Responsible Party
1) Soil	Area will be landscaped after construction.	• Landscaping to be undertaken after the contractor has finished with construction. • Removed trees will be replaced with indigenous plants that are aesthetically pleasing, which are representative of the floral species particular to the appropriate vegetation type (Table 4).	Client
	Pollutants such as fuel and oil spillages from vehicles may affect the soil	• This would result in an increase in the number of vehicles using the roads and is therefore not controllable by the project proponent. • Vehicles used by the estate management should be serviced regularly to potentially reduce oil leaks.	Public and Client
2) Surface Water	No foreseeable impacts expected	No foreseeable impacts expected	-
3) Groundwater	Groundwater may be contaminated via runoff fluids from vehicle accidents (e.g. trucks transporting chemicals).	This would be the same as soil	Public
4) Flora	• Damage to plant life.	• Workers and machinery to remain inside construction footprint. All labourers to be informed of disciplinary actions for the wilful damage to plants.	Client
5) Fauna	• Damage to fauna (e.g. poaching, wilful damage).	• No animal may be snared, captured or wilfully damaged or destroyed, unless declared as a pest by the ECO. • Disturbances to nesting sites of birds must be avoided, as far as possible. • Animal movement must not be hindered. • All labourers to remain inside construction footprint. • All labourers to be informed of disciplinary actions for the wilful damage to animals.	Client

Environmental Consideration	Environmental Impacts	Mitigation Measures	Responsible Party
6) General		• The relevant mitigation measures proposed for the construction phase should be carried forward to operations, where potential environmental impacts may still occur. • Special conditions relating to operations, as stipulated in the RoD, need to be adhered to. • The contractor must perform appropriate maintenance functions, as required. Responsible parties must be competent in the necessary maintenance tasks. • Feedback must be provided to the ECO and project proponent on a frequent basis.	Client

5. Conclusion.

The Contractor can use **Appendix D** as a standalone document, as the mitigation measures contained therein address the potential negative impacts associated with the project. Following the recruitment of the aforesaid mitigation measures, no impacts with a significance rating of 1 or higher will remain.